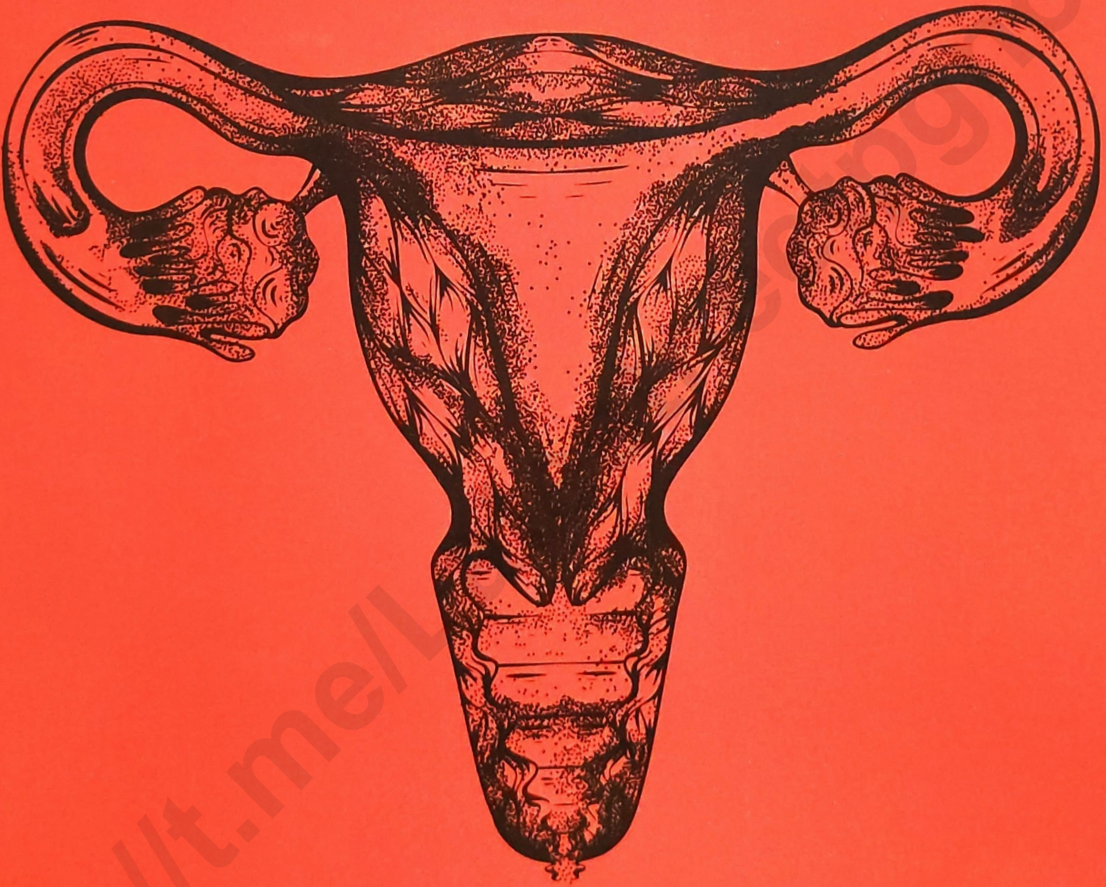
PrepLadder

# FMGE NOTES

CLICK ON "FMGE NOTES" FOR MORE!!!



# GYNAECOLOGY & OBSTETRICS

Based on video lectures by
Dr. Prassan Vij

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# INDEX

## OBSTETRICS

1. COVID in Pregnancy 1
2. Post Partum Hemorrhage 4
3. Placenta- Types and their Complications 10
4. Rh Incompatibility 15
5. Twin Pregnancy 20
6. Molar Pregnancy & GTD 29
7. Ante Partum Hemorrhage 35
8. Hypertension in Pregnancy 43
9. Gestational Diabetes Mellitus 49
10. Intrauterine Growth Restriction 55
11. Medical illness Complicating Pregnancy 62
12. Infections in Pregnancy 67
13. Drugs in Pregnancy 80
14. Anemia in Pregnancy 84
15. Vomiting in Pregnancy 88
16. Ectopic Pregnancy 91
17. Abortion 98
18. Physiological changes of Pregnancy 108
19. Diagnosis of Pregnancy 116
20. Prenatal Diagnosis 119
21. Preterm Labor 124
22. PNDT Act 132
23. Fetal Circulation 137
24. Amniotic Fluid Dynamics 141
25. Labor 145
26. Episiotomy 167
27. Puerperium 169
28. Cesarean Section 175
29. Special Situations in Obstetrics 180

# INDEX

## GYNAECOLOGY

1. Menstruation 190
2. Ovarian Hyperstimulation Syndrome 200
3. Tests Of Ovulation 204
4. Endometriosis Adenomyosis 205
5. Hormonal Replacement Therapy 212
6. Endometrial Carcinoma 218
7. Ovarian Tumors 224
8. Polycystic Ovarian Syndrome 232
9. Cervical Carcinoma 238
10. Post Menopausal Bleeding 247
11. Vulvar Carcinoma 248
12. Fibroids 252
13. Hysterectomy 258
14. Mullerian Abnormalities 262
15. Abnormal Uterine Bleeding 267
16. Gametogenesis 270
17. Intersex 276
18. Pubertal Changes 283
19. Infertility 285
20. Genital Prolapse 291
21. Urinary Fistula 298
22. Emergenency Contraceptives 305
23. Contraception 321
24. Genital Tract Infections 333
25. Amenorrhea 339
26. Drugs Used in Obstetrics & Gynaecology 343
27. Instruments in Obstetrics & Gynaecology 353

# Chapter 1

# COVID in Pregnancy

**Problems expected & seen in pregnant women**

- Cough, fever and shortness of breath.
- Severe symptoms such as
  - Pneumonia and
  - Marked hypoxia

Seen in the

- Immuno-suppressed
- Long term conditions such as diabetes, cancer and chronic lung disease.

So far.... Till 9th march 2020

- One pregnant woman with Covid 19
- Required mechanical ventilation at 30 weeks gestation
- Following which she had an emergency caesarean section and made a good recovery

* Pregnant women do not appear to be more susceptible to the consequences of infection with COVID-19 than the general population.

**Vertical Transmission**

- Only one case of possible vertical transmission
- Expert opinion is that the fetus is unlikely to be exposed during pregnancy.
- Amniotic fluid, cord blood, neonatal throat swabs and breast milk samples from COVID-19 infected mothers were tested
  - And all samples tested negative for the virus
  - Transmission is therefore most likely to be as a Neonate.

Intra - natal transmission

- Currently no evidence concerning transmission through genital fluids.

Effect on the fetus

- No data suggesting
  - Increased risk of miscarriage
  - Early pregnancy loss in relation to COVID-19.
  - As there is no evidence of intrauterine fetal infection with COVID-19, it is therefore currently considered unlikely that there will be congenital effects of the virus on fetal development.

Advice for Antenatal Woman

- Antenatal women : Be advised to self-isolate, should stay indoor and avoid contact with other for 14 days.
- For these women the guidance currently recommends :
  - Not go to work or public areas
  - Not use public transport
  - Stay at home and not allow visitors
  - Ventilate the rooms by opening a window
  - Separate themselves from other members of their household as far as possible
  - Using their own towels, crockery and utensils and eating at different times
  - Use friends, family or delivery services to run errands, but advise them to leave items outside.

In labour : Electronic fetal monitoring using Cardiotocograph (CTG)

- In two Chinese case series, including a total of 18 pregnant women infected with COVID-19 and 19 babies (one set of twins), there were 8 reported cases of fetal compromise
- Hence
  - Continuous electronic fetal monitoring in labour is currently recommended for all women with COVID-19.

Mode of Delivery

- Should not be influenced by the presence of COVID-19, unless the woman's respiratory condition demands urgent delivery.
- Decision to do operative delivery is based on the obstetric requirements
- Delayed cord clamping is still recommended following birth, provided there are no other contraindications.

Neonate

- All babies of women with suspected or confirmed COVID-19 need to be tested for COVID-19.
- Literature from china has advised separate isolation of the infected mother and her baby for 14 days.
- Hence, even if breast feed does not transmit the virus, it is best avoided as the baby is to be isolated from the mother, however the mother may be given an option of rooming in & breast feeding the baby if she wishes , more so in developing countries like ours, where expressed feeding by another care taker or formula feeding may not always be possible.

  she should be explained the risk of transmission and be able to make an informed choice

# Chapter 2

## POSTPARTUM HEMORRHAGE

- MMR → around 130/100,000 women
  → MCC - Obstetric hemorrhage

| OBSTETRIC HEMORRHAGE - | TYPES |
|---|---|
| 1 Ante-partum Hemorrhage | → Any bleed in genital tract after 28 wks & before delivery |
| 2 Postpartum Hemorrhage | → Any bleed in genital tract after delivery<br>→ MCC of MMR in India |

### Post Partum Hemorrhage (PPH)

00:02:26

DEFINITIONS

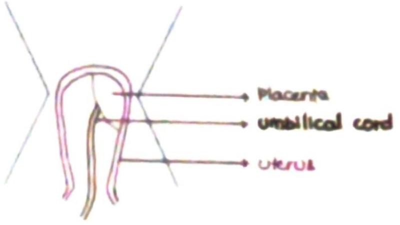
- › 500ml in normal delivery
- › 1000 ml in a cesarean section
-

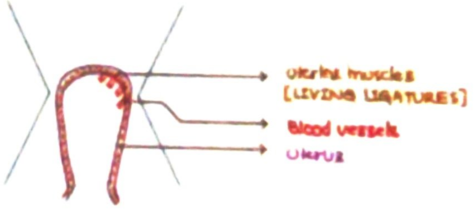
| | |
|---|---|
| Mild PPH | → › 500 ml to 1000 ml |
| Moderate PPH | → › 1000 ml to 2000 ml |
| Severe PPH | → › 2000 ml |
| Massive obstetric Hemorrhage | → › 1500 ml |

- Any Hemorrhage which can reduce Hb by 1 gm% → PPH
- If Hb drops by › 4gm% → Massive obstetric Hemorrhage

### Active Management of 3rd Stage of Labor

00:07:10





After Removing Placenta [CONTROLLED CORD TRACT^n]

https://t.me/Latestreetpgnotes

- Controlled cord traction
- Uterine massage
- Oxytocin

- Incidence of PPH → 5%

## Causes 00:09:53

1. **Atonic Uterus (80%)**
   - Large uterus → Big baby/ Twins/ ↑ liquor (Polyhydramnios)
   - Infections → PROM / Chorioamnionitis
   - Prolonged labor
2. **Injuries (Trauma)** → Uterus, cervix, vagina
3. **Coagulopathies** → Von Willebrands Disease (VWD)
   → Idiopathic Thrombocytic purpura (I.T.P)
4. **Retained Tissues** → Secondary PPH (after 24 Hrs, uptill 12 wks)

- Causes → 4T's
  - T → Poor Tone
  - T → Trauma
  - T → Thrombin Deficiency
  - T → Tissue (Retained)
- **Primary PPH** →Within 1st 24 Hrs (1st 1 hr is MC time)
- **Secondary PPH** → 24 hrs till 12 wks

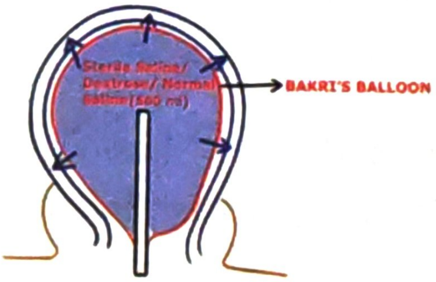
## Management 00:16:53

- Prevention of PPH
  - Oxytocin is DOC
  - Prophylactic IM/ IV Oxytocin (5-10 units) after delivery of shoulders
- Treatment of PPH
  1. IV Oxytocin [10-20 units drip] [DOC]
  2. IV Methyl Ergometrine 0.2 mg [peak action at 90 sec]
     - Can also be given IM
     - Contra indications
       - ○ Heart disease

- ○ PIH [Pregnancy Induced HTN]
- ○ Rh Iso immunization
- ○ Before 2nd twin is delivered

3. Tab MISOPROSTAL ($PGE_1$) - 1000 µg per rectum
4. Inj. CARBOPROST ($PGF_2 \alpha$)
   - IM only
   - Never given IV – causes sudden HTN
5. Recombinant VII - 90 mcg/kg body wt. in 3-5 min IV infusion
6. Fibrinogen - Maintain › 1 gm/Ltr [›100 mg/dL]
   - Cryoprecipitate (3ml/kg) - › 10 times fibrinogen concentration vs FFP [30 ml/kg]
   - ○ 10 units of Cryoprecipitate or
   - ○ 1 litre of FFP
7. Uterine artery embolization
   - Prophylaxis for Placenta Previa, Placenta Accreta
   - for Rx in acute conditions
8. Intravascular AORTIC balloon compression – Prophylactic

9. Balloon Tamponade 00:31:02
   - Bakri's balloon [Now-a-days]
   - Bakri's balloon is distended by 500 ml fluids
   - Sengstaken tube
   - Foley's catheter [can hold up to 100 ml of fluids]
   - Condoms



## 10.SURGICAL METHODS: 00:34:01

a. Compression / Brace sutures → Christopher B lynch in 1997

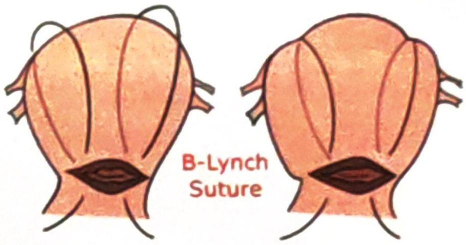
b. Hayman's sutures

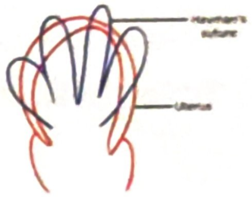
c. Uterine artery ligation

d. Ovarian artery ligation

e. Internal Iliac artery ligation

f. Hysterectomy



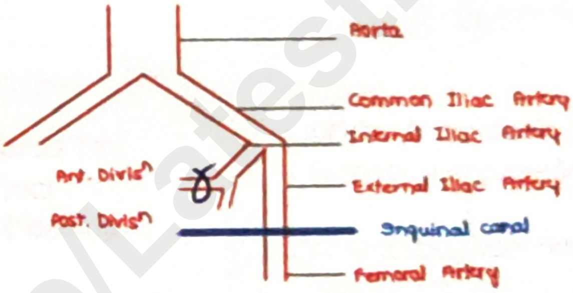


HAYMAN'S SUTURE

- INTERNAL ILIAC ARTERY LIGATION 00:37:40

Branches of Ant. division of Internal Iliac Artery:

- Uterine
- Obturator
- Superior vesical
- Inferior vesical
- Internal pudendal
- Middle rectal
- Inferior gluteal
- Vulval
- Clitoral



Posterior Division Internal Iliac Artery Branches

| | |
|---|---|
| – Superior Gluteal | Short G |
| – Iliolumbar | IL |
| – Lateral sacral | LS |

PRINCIPLE

- Using a snug ligature we reduce the pulse pressure (therefore pressure of Artery reduces and becomes appx. equal to vein → sluggish flow → Induces Thrombosis

## THERAPEUTICAL GOALS

00:42:21

- Hb → › 8 gm/dl
  Fibrinogen → › 100 mg/dl
  Prothrombin Time → ‹ 1.5 times of Ⓝ
  Activated Partial Thromboplastin Time → ‹ 1.5 times of Ⓝ
  Platelet count → › 75000
- Immediate O -ve Blood Transfusion can be given
- 4 units of group matched blood through ② 14 gauge IV cannulas.

# Postpartum hemorrhage

## Definition

- › 500 ml in normal delivery
- › 1000 ml in cesarean section

Mild PPH – 500 ml to 1000 ml
Moderate PPH – 1000 ml to 2000 ml
Severe PPH - ›2000 ml

## Classification of PPH

Primary PPH – within 24 hrs of delivery / mcc : atonic uterus
Secondary PPH – after 24 hrs but before 12 weeks of delivery
Mcc - retained placental tissue

## Causes

4 Ts
1st T – ↓ Tone of uterus (mc)
2nd T – Trauma (2nd mc)
3rd T – ↓ Thrombin (bleeding disorder)
4th T – Tissue (retained placental tissue)

## Management

Medical
- DOC → IV oxytocin (10-20 units drip)
- IV methyl ergometrine 0.2 mg.

↓

Contraindication: heart disease

- Tab. Misoprostol (PGE1) – 1000 μg / rectum
- Injection carbo prost (PGF2α) IM only

Mechanical method:
- uterine massage
- sengstaken blakemore tube

Or
Bakri balloon catheter

Surgical methods
- B- Lynch suture
- Hayman suture
- B/L ligation of arteries supplying uterus
- Hysterectomy

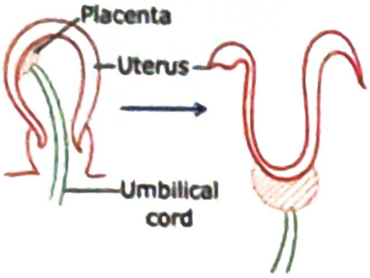
# Chapter 3

# PLACENTA

## UTERINE INVERSION

00:01:21

Definition - defined as turning inside out of the fundus into uterine cavity following child birth



INVERSION OF UTERUS

- Inversion causes → Neurogenic shock (pain)
  → Hemorrhagic shock
- MCC of death d/t Inversion → Hemorrhagic shock

## CAUSES

00:02:37

- Fundal Implantation of Placenta
- Uterine atony
- Badly adhered placenta
- Sudden cord traction

## MANAGEMENT

00:03:49

- Get IV Access
- Give rapid infusion of fluids, arrange Blood
- Try & Reposit ASAP

1) Manual Reposition
2) Hydrostatic Reposition → O' Sullivan's method

- Give Inj Terbutaline → Relaxes Uterus

  ↓

  Reposit

  ↓

  Give Inj. Oxytocin
  Inj. Methylergometrine

- Surgical Methods
  - Huntington's Method → Atraumatic clamps
  - Haultian Method → Resection of the constricting Bands

## SEPARATION OF PLACENTA 00:09:41

### METHODS

- Controlled Cord Traction (BRANDT & ANDREW's Method)
- CREDES METHOD (Obsolete now)
  - Causes RETAINED PLACENTAL BITS
  - Gives early separation of Placenta

### SIGNS 00:11:34

- Lengthening of Cord
- Fresh bleeding
- Supra pubic bulge (Most specific sign)

### RETAINED PLACENTA 00:13:00

- Separation of Placenta (Third stage of Labor) → >30 min
- Management
  - Manual Removal of Placenta under General Anesthesia
  - Retained Placental BIT → causes 2° PPH
    Mx by Currettage → Complication → Ashermann Syndrome

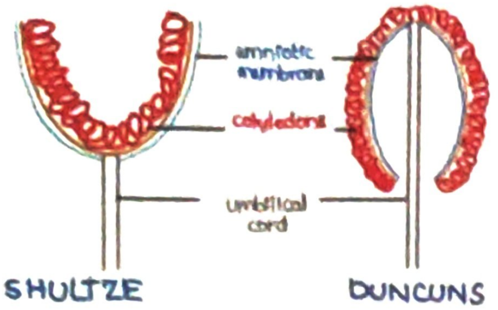
### MODE OF SEPARATION 00:18:40

Central Separation/ Shultze Separation → SHINY

- Membranes come first ; More Common

### Marginal Separation / Duncuns Separation → DIRTY

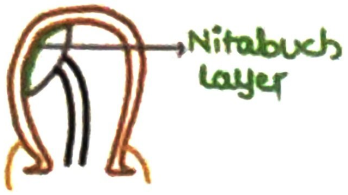
- Cotyledons comes first



### NITABUCH LAYER

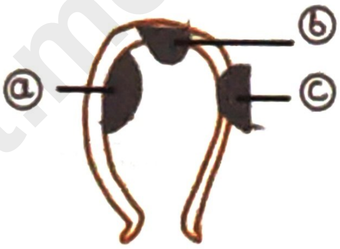
00:24:45

- Fibrinoid layer at which Placental separation happens



- Absence of layer → Morbidly adherent placenta
  a. PLACENTA ACCRETA
  b. PLACENTA INCRETA
  c. PLACENTA PERCRETA

  } Can cause severe PPH



### MANAGEMENT

- Laparotomy + Obstetric Hysterectomy
- If able to save the Uterus

↓

Give Post Op → Methotrexate, Actinomycin } to prevent the persistence of Trophoblastic tissues

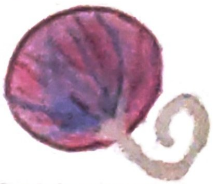
## PREDISPOSING CONDITIONS

00:29:31

- Previous Cesarean Section
- Previous Currettage
- Placenta Previa (low Lying Placenta) – MC
- Chronic Infections

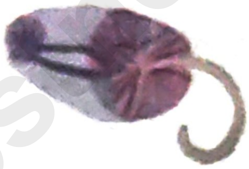
## BATTLEDORE PLACENTA

- Marginal Insertion
- Can get detached in delivery of placenta & present as retained placental bits



Battledore / Marginal Insertion

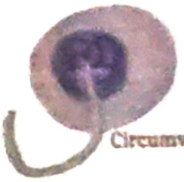
## ACCESSORY / SUCCENTURIATE LOBE



Succenturiate Lobe

- Form Placental retained bit
- Retained bit can lead to secondary PPH

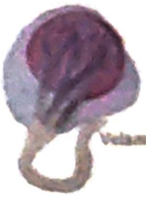
## CIRCUMVALLETE PLACENTA



Circumvallate

- Chorionic plate is smaller than decidual plate
- Central Clearing
- Doubled up membrane on the periphery
- May be a/w IUGR & APH

## VELLAMENTOUS CORD



Velamentous Insertion

- Splitting of cord present
- VASA PREVIA → Vellamentous Cord at Os
  - Can have fetal bleeding (50% fatal)
  - Painless bleeding

00:38:55

- Diagnosis
  - Doppler (Best)

- **APT TEST** (Alkaline denaturation test)

- Addition of NaOH to vaginal blood in a test tube → causes Alkaline Denaturation

| | |
|---|---|
| Colourless → | Maternal blood |
| Stays red → | Fetal RBC |

- Helps to distinguish between maternal & Fetal RBC's
- Qualitative test

* Fetal RBC's are resistant to Alkaline denaturation

* **KLIE HAUER BETKE TEST**

- Quantitative test
- Used to calculate dose of Anti-D in Rh iso immunization

- **SINGER'S TEST**
  - Qualitative test
  - Alkaline denaturation test

## Chapter 4

# RH INCOMPATIBILITY

## Rh ISOIMMUNIZATION 00:00:16

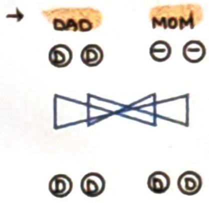
- ≅ Rh Allo immunization → Antibodies made in one human body acts against Red cells of another human body

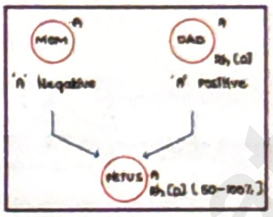
## Rh factor 00:01:14

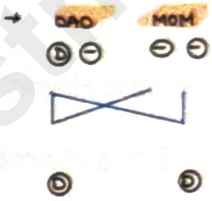
- Present on Chromosome 1
- Antigens in Rh factor
  - RHD / RHCE

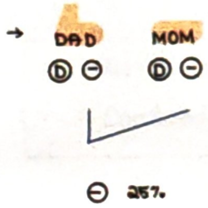
    ↓ ↓

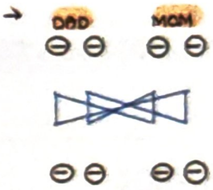
    D CcEe
  - Main antigen → D











Mother's blood gets MIXED with fetal blood at the time of

- Delivery (5-30 ml) (MC)
- Abortion
- Molar Pregnancy
- Ectopic pregnancy
- Abruption
- Injury of abdomen
- Amniocentesis
- Chorionic Villi Sampling

(1) Rh Negative Mother + Rh Positive Baby
- Sensitization of Mother
- 1st Baby will be safe

(2) Rh Sensitized mother + Rh Positive Baby
- Rh Incompatibility occurs
- Baby is not safe

Antigen / Antibody reaction on Fetal RBCs 00:14:00
- Hemolysis
- Anemia
- ↑ Bilirubin → Jaundice, Kernicterus (> 20mg/dl)
- ↑ 3rd Space collections → Ascites,
  Pleural effusion
  Pericardial effusion
  Edema
  } HYDROPS FETALIS

ERYTHROBLASTOSIS FETALIS (HDFN- hemolytic disease of fetus & new born)

*Increased Hemolysis
↓
Compensated by Bone Marrow Hyperplasia
↓
Increased Red cell production
↓
Erythroblastosis fetalis

PREVENTION 00:16:38
- Mortality → 20-30%
- Anti- D 300 µg within 72 hrs
  - Will neutralize 30 ml blood (15 m RBCs)
  - Can be given upto 4 wks

ANOTHER SITUATION
- 1st PREGNANCY → Rh Negative mother & Rh positive Baby
  ↓
  ANTI – D GIVEN within 72 hrs
  ↓
- 2nd PREGNANCY → Baby dies d/t Hydrops fetalis
  ↓
  PROBABLE CAUSES 00:22:40

## PROBABLE CAUSES

### 1. NON IMMUNE HYDROPS FETALIS

MCC of Hydrops Fetalis

CAUSES

| | |
|---|---|
| - Cardiac (MC) | → Congenital Heart Block |
| - Infectious | → Parvo Virus B – 19 |
| - GI Causes | |
| - Haemotological | → α Thalassemia |
| - Renal | → Polycystic Kidney disease |
| - Genito Urinary | → Posterior Urethral Valve |
| - Cystic Hygroma | |

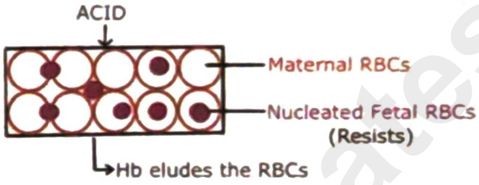
### 2. ABORTION

### 3. MIXED – MATCHED BLOOD TRANSFUSION

### 4. INADEQUATE ANTI – D

## KLIEHAUER BETKE TEST (Acid Elution Technique) 00:30:50

- Meaures Fetomaternal Hemorrhage
- Quantitative Test



- $\text{FMH} = \%\ \text{Contamination} \times \text{Maternal Blood Volume} \times \frac{\text{Maternal Hematocrit}}{\text{Fetal Hematocrit}}$
- $\%\ \text{Contamination} = \frac{\text{Fetal RBCs}}{\text{Maternal RBCs}}$, Eg $= \frac{3}{300} = 1\ \%$

Q. Mother wt. = 60 kg; % contamination = 1 %, calculate dose of Anti-D ?

A. Maternal blood volume = 60 x 100 = 6000 ml

FMH = 1/100 x 6000 = 60 ml

- 30 ml blood is neutralized by 300 µg Anti-D
- Therefore 60 ml blood will be neutralized by 600 µg Anti-D

* Maternal blood volume at term = 100 ml/ kg body wt.

## CASE 1

- Rh Negative & 1st Visit

### INDIRECT COOMB's TEST

00:37:37

1st Visit → Negative
20 weeks → Negative
24 weeks → Negative
28 weeks → Negative
32 weeks → Negative
36 weeks → Negative
40 weeks → Delivered

## CASE 2

- Rh Negative & 1st Visit

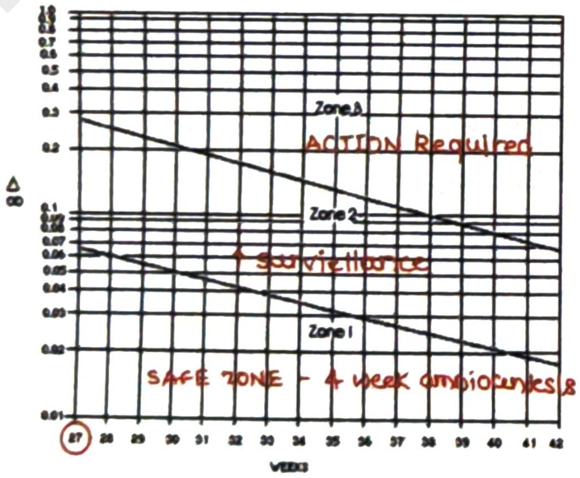
### INDIRECT COOMB's TEST

1st Visit → Negative
20 weeks → Negative
24 Weeks → Positive (1:16 +ve is safe)
25 Weeks → 1:16 Positive
26 Weeks → 1:16 Positive
27 Weeks → 1:16 Positive
28 Weeks → 1:1024 Positive

- Do Amniocentesis & Do Spectrophotometry with the Amniotic Fluid (Bilirubin) & plot following graphs

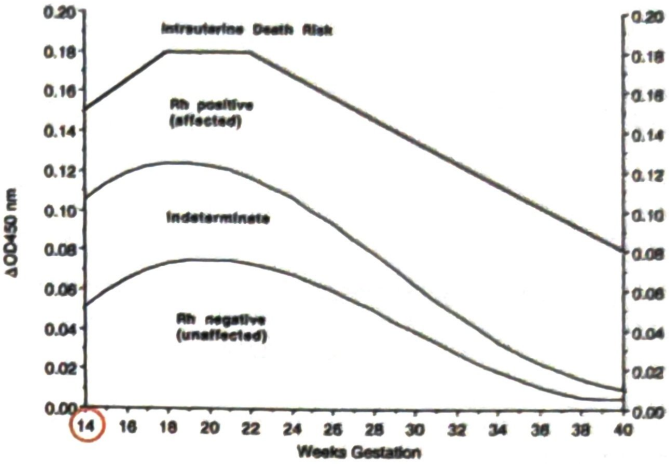
### LILLEY's GRAPH

- Can be charted from 27 weeks onwards only



## QUEENAN's CHART (more sensitivity)

- Can be charted from 14 wks onwards



**Q.** Optical Density at 28 weeks increased from 0.5 to 0.8 (Upper 3rd Zone). MANAGEMENT should be?

**A.** Intra Uterine Blood Transfusion into the cord or Intra Peritoneal transfusion

## PREVENTIVE MEASURES

(Prophylaxis while the woman is pregnant for first time)

- Rh Negative & 1st Visit

### INDIRECT COOMB's TEST

1st Visit → Negative
20 weeks → Negative
24 weeks → Negative
28 weeks → Negative → Inj ANTI - D 300 µg (work for 6 wks)
34 weeks → Negative → Inj ANTI - D 300 µg
At Delivery → Positive → Inj ANTI - D 300 µg
→ Negative → Nothing to be done
→ Prophylactic Anti - D now is given at 28 wks & then at delivery if Baby is Rh +ve & omitted at 34 weeks

# TWIN PREGNANCY

## TWIN PREGNANCY

### HELLIN'S LAW 00:00:44

- Incidence

Twins → 1 in 80 Pregnancies
Triplets → 1 in $(80)^2$ Pregnancies
Quadruples → 1 in $(80)^3$ Pregnancies

↑ CHANCE

- ↑ Age
- ↑ Parity
- ↑ Maternal weight
- Hereditary factor (Maternal > Paternal)
- Blacks > Caucasians
- Infertility Rx → CLOMIPHENE CITRATE, IVF

* Twins with Clomiphene Citrate → 8% (6-12%)
* Twins with IVF → 25-30%

## COMPLICATIONS ASSOCIATED WITH TWIN PREGNANCY 00:03:48

| MATERNAL COMPLICATIONS | FETAL COMPLICATIONS |
|---|---|
| - ↑ Abortions<br>- ↑ Hyperemesis<br>- ↑ Preterm labour<br>- ↑ HTN / PET<br>- ↑ DM<br>- ↑ PPH | - ↑ IUGR<br>- Discordant twins<br>- Single Fetal Demise<br>- Congenital anomalies (12 folds ↑ incidence)<br>- ↑ Malpresentation<br>- Twin Twin Tranfusion Syndrome |

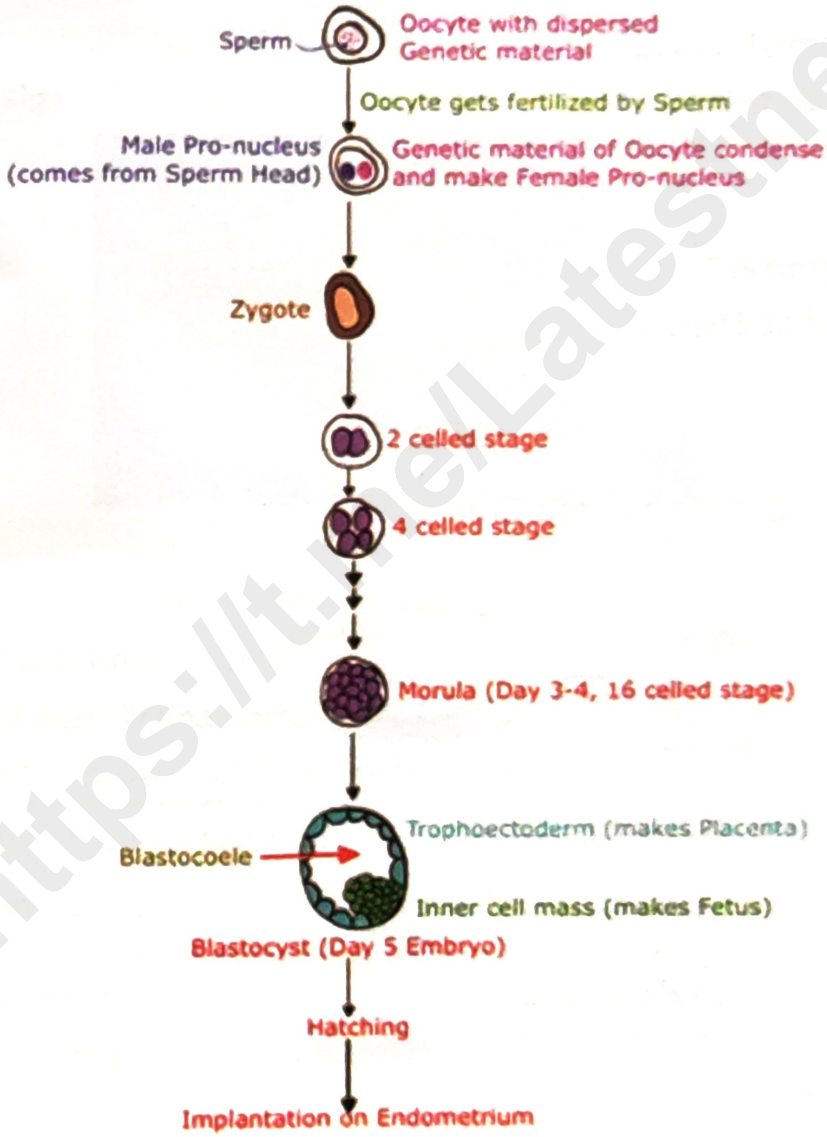
- * Congenital anomalies are more in Monochorionic twins as compared to Dichorionic twins
- * Most common congenital anomalies in twins are Cardiac anomalies

## PLACENTAL COMPLICATIONS

- ↑ Placenta Previa
- ↑ Abruptions
- Cord Entanglement (seen in Monochorionic twins as they share common sac)
- PROM

## EVENTS OF ZYGOTE FORMATION

00:07:08


Sperm
Oocyte with dispersed Genetic material
Oocyte gets fertilized by Sperm
Male Pro-nucleus (comes from Sperm Head)
Genetic material of Oocyte condense and make Female Pro-nucleus
Zygote
2 celled stage
4 celled stage
Morula (Day 3-4, 16 celled stage)
Trophoectoderm (makes Placenta)
Blastocoele
Inner cell mass (makes Fetus)
Blastocyst (Day 5 Embryo)
Hatching
Implantation on Endometrium

## FORMATION OF TWINS

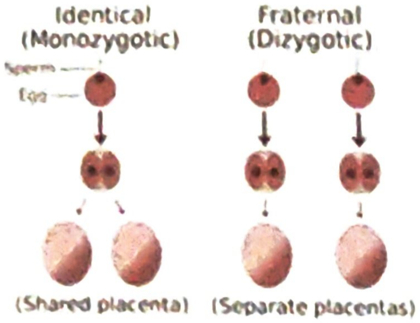
00:10:08

### MONOZYGOTIC/ IDENTICAL TWINS

- Incidence → 1/250 pregnancies

### DYZYGOTIC / NON IDENTICAL / FRATERNAL TWINS

- Incidence → 1/60 – 1/80 Pregnancies



### SUPERFECUNDATION

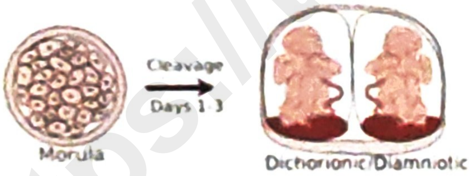
- 2 Oocytes fertilized by 2 Sperms in 1 Cycle
- Most common type of Dizygotic twins

### SUPER FETATION

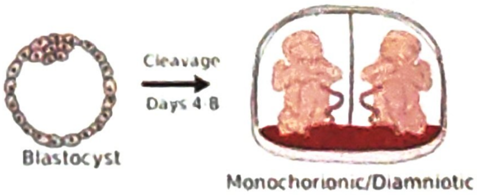
- 2 Oocytes fertilized by 2 Sperms in 2 Cycles
- Rare in humans, common in cattle & horses

### FATE OF MONOZYGOTIC TWINS

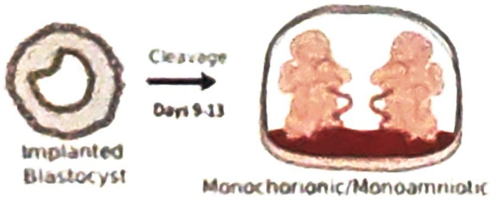
1. Dichorionic Diamniotic (30-35%)



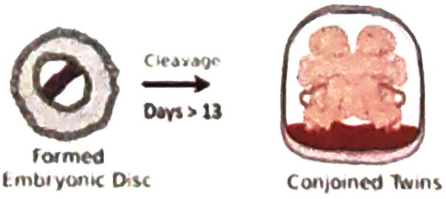
2. Monochorionic Diamniotic (Mo-Di) (40-45%)



3. Monochorionic Monomniotic (Mo-Mo)



4. Conjoined/ Siamese



- * MC type of Monozygotic twins → Monochorionic Diamniotic
- * MC Conjoined twins → Thoracopagus

Fate of Dizygotic Twins → Always Dichorionic Diamniotic (DCDA)

- * Best / Least Complicated Type of Twin Pregnancy → DCDA

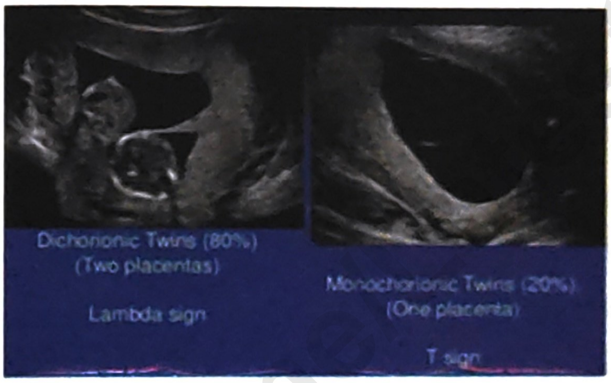
## CHORIONICITY SCAN 00:23:40

### 1. DICHORIONIC DIAMINIOTIC

- 2 Placentas, 2 Sacs
- Twin Peak/Lambda Sign
- Inter twin membrane thickness → › 2mm

### 2. MONOCHORIONIC DIAMNIOTIC

- T sign



## MONOZYGOTIC TWINS COMPLICATIONS 00:29:25

1. Twin Twin Transfusion Syndrome (TTTS)
    - d/t deep AV Anastomosis
    - MC in MCDA › MCMA

> MCMA has protective Arterio – Arterial Anastomosis
> ↓
> Reverse the chances of TTTS in MCMA Pregnancy

- Donor twin
    - Anemic
    - Low wt.
    - ↓ liquor (Oligohydramnios)

- Recipient twin
  - Plethoric, Polycyathemic
  - Large size baby
  - Polyhydramnios

* TTTS Twins show "Poly-Oli" sequence

### Dx OF TTTS

- MCDA picture on USG
- Doppler localization of A-V anastomosis
- Oligoamnios (<2cm liquor pocket) in Donor
- Polyhydramnios (>8cm liquor pocket) in Recipient
- Hb difference → ≥ 5gm %
- Wt. difference → > 20% (Larger twin taken as Index)

### Mx of TTTS

- Mortality d/t TTTS, if present at 26 wks or before → 100%
- Dx is made by USG & Doppler localization of A-V anastomosis
- Rx
  - ○ Laser Ablation of A-V anastomosis
  - ○ Amnioreduction of larger baby (Poly hydramnios)
  - ○ Single fetal reduction

### 2. Twin Anemia Polycythemia Sequence (TAPS)

- Hb difference → ≥ 5gm %
- No wt. difference
- No liquor difference
- Dx of TAPS
  - ○ Donor twin → MCA PSV ↑ > 1.5 MoM
  - ○ Recipient twin → MCA PSV < 1.0 MoM

* MCA = Middle Cerebral Artery

* PSV = Peak Systolic Velocity

### 3. Twin Reverse Arterial Perfusion Syndrome (TRAP)

Donor Twin ⟶ Recipient Twin
(Normal Healthy Baby) (Acardiac)

- Cardiac failure in Donor baby occurs as it is pumping blood to himself as well as Recipient baby
- The blood goes from Donor to Recipient via A-V anastomosis (AV anastomosis have deoxygenated blood)

↓

Deoxygenated blood going into Recipient twin keeps it alive

↓

However this deoxygenated blood goes only to lower limb of baby resulting in

↓

Mass of flesh with very small head & properly formed lower limbs

### 4. Single Fetal Demise

- If happens in Early Pregnancy (1st trimester)

↓

Baby gets totally absorbed

↓

Vanishing twin (i.e. the Normal baby will we born & other baby won't be seen at delivery)

- If happens in late 2nd trimester or 3rd trimester
  - Both healthy and compromised baby are well formed so there are more complications likely to occur in this scenario
  - Dead baby can have necrotic tissues within body of Mother & can trigger Intrinsic coagulation cascade & can cause
    - DIC – coagulopathy
    - Neurological sequlae to Healthy baby
    - PTL (Preterm Labor)
    - Death of Healthy baby
- Mx of single fetal demise in late 2nd trimester or 3rd trimester
  - Try & Deliver the pregnancy in next 3 wks under Steroid cover

- Monitor Prothrombin Time, Partial Thromboplastin Time, D-Dimers, Coagulation profile

5. Discordant Twins
   - Mono chorionic Twins → d/t Vascular Anomalies
   - Dichorionic Twins
     - ○ 2 different Placentas that can cause Nutritional differences
     - ○ Genetic factors
   - Criteria of Discordance
     - ○ Abdominal circumference → > 20mm
     - ○ Wt difference → > 20%

6. Cord entanglement
   - Occurs in MCMA
   - Much lesser chance ≥ 32 wks

7. Abruption
8. PROM
9. Sepsis
10. IUD of one or both fetuses

## CLINICAL DIAGNOSIS OF TWIN PREGNANCY 00:47:45

- Uterine height > POG
- Multiple fetal parts felt on Leopold maneuver
- 2 fetal heads felt on Leopold maneuver

## MATERNAL COMPLICATION D/T TWIN PREGNANCY

- ↑ HCG → ↑ Hyperemesis
- ↑ Fluid volume in body → ↑ Cardiac output → ↑ Chances of Cardiac failure
- Anemia more likely in twins as compared to Singleton pregnancy
- ↑ Liqour → Compression of Ureters → Obstructive Uropathy

## Mx OF ANTENATAL CARE 00:51:22

- Diet: 40-45 Kcal/kg/day

| Dietary factor | Twin pregnancy | Singleton pregnancy |
|---|---|---|
| Carbohydrates | 40% | 50% |
| Fats | 40% | 20% |
| Proteins | 20% | 30% |

- USG
  - Monochorionic gestation → 2 weekly USG
- ↑ Fetal surveillance
  - Regular NST of both twins separately
  - Biophysical profile
  - Doppler (Decisions are based on Doppler of Smaller baby's readings)
- Timing of delivery 00:54:58
  - DCDA → 38 wks → delivered
  - Monochorionic Gestations → 34 wks → deliver
    (32 wks + Steroids → Deliver)
- Delivery requirements for Twins/ Multifetal Pregnancy
  - Tertiary care Hospital
  - Team of Obstetricians
  - Emergency Anaesthesist
  - 2 Patent large bore IV lines
  - Arrange Blood (for PPH)
  - Labor Analgesia should be given
  - Facility of Emergency C-section
  - 2 Neonatologists
  - Portable USG machine in Labor room for Antenatal & Intranatal monitoring

## MODE OF PRESENTATION & DELIVERY 00:58:02

- Both Cephalic (> 60%) } Normal vaginal delivery can be done
- First Cephalic, 2nd breech }
- First Breech, 2nd breech → Cesarean section
- First Breech, 2nd cephalic → Cesarean section

* 1st twin in Breech → Complicated Breech

- Interlocking of Twins 01:00:53
  - Happens when 1st Twin is in Breech, 2nd Twin is Cephalic
  - Very rarely seen
- Cord prolapse during twin delivery
  - 1st Twin Cephalic → Delivered
  - 2nd Twin Breech → Little High → Cord Prolapse can happen

# Chapter 6

# MOLAR PREGNANCY & GTD

## MOLAR PREGNANCY

### COMPLETE MOLE 00:33:00

#### TYPE 1

- Always happen with a sperm of 23 X
- Endoduplication occurs
- Both chromosomes are of Paternal origin
- Aka Vesicular mole → SNOW STORM APPEARANCE ON USG

#### TYPE 2

- Empty ovum Fertilized by 2 sperms of 23 X each
- No duplication occurs

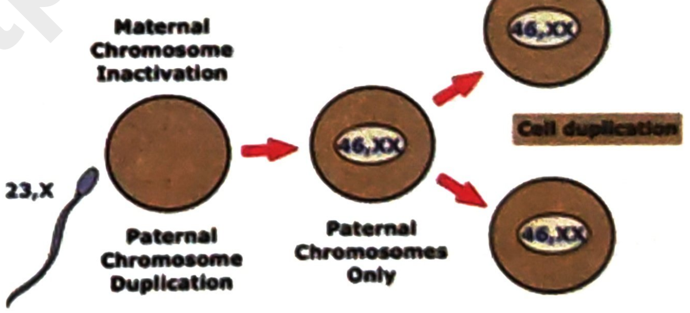
#### TYPE 3

- Empty ovum fertilized by 2 Sperms of 23 X & 23 Y
- No duplication occurs
- Can never be 23 YY

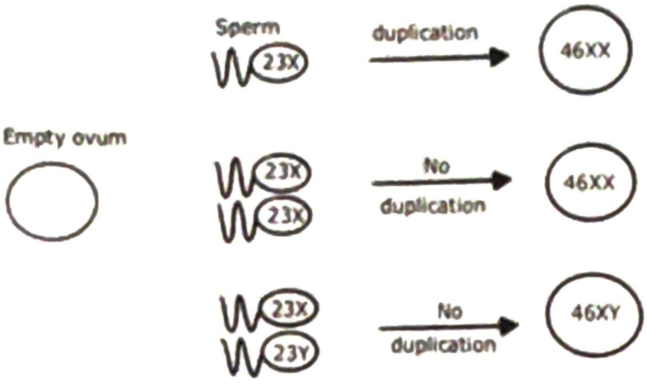
### PARTIAL MOLE 00:37:26

- Non Viable beyond 12-16wks
- Almost no chance or 2-4% chances of Choriocarcinoma
- Can be 69 XXX (MC), 69 XXY, 69 XYY, but never 69 YYY

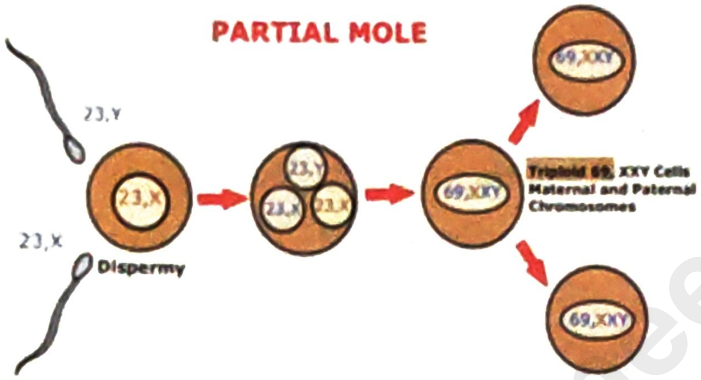
**Complete Mole**


Maternal Chromosome Inactivation
23,X
Paternal Chromosome Duplication
46,XX
Paternal Chromosomes Only
Cell duplication
46,XX
46,XX

## COMPLETE MOLE - TYPES



## PARTIAL MOLE



| PARTIAL MOLE | COMPLETE MOLE 00:38:05 |
|---|---|
| – Fetus present | – No fetus |
| – Focal Trophoblastic hyperplasia | – Diffuse Trophoblastic hyperplasia |
| – Focal Chorionic villi swelling | – Diffuse chorionic villi swelling |
| – Scalloping of villi +nt | – Scalloping of villi absent |
| – Trophoblastic stromal Inclusion +nt | – Trophoblastic stromal inclusion -nt |
| – Chance of Choriocarcinoma is 2-4% | – Chance of Choriocarcinoma is 20% |

## ASSOCIATED MORE WITH

- Asian / South East Asians (Rice eaters)
- Vit A deficiency
- Elderly Pregnancy

## DIAGNOSIS

1. USG
2. Flow Cytometry
3. Immuno Histochemistry

} More specific tests

– IF P57 is -ve → Complete mole

## PRESENTATION 00:41:52

INCOMPLETE MOLE → Missed Abortion like presentation

COMPLETE MOLE

- ↑↑HCG
  - Thyrotoxicosis [During Evacuation, patient may suffer from Thyroid Storm (↑Pulse Rate, ↑Temp, High Output Cardiac Failure)
    - ○ Keep β blocker ready while doing Evacuation
  - Hypermesis
- Passage of grape like vesicles (Rare)
- Bleeding PV (MC Presentation)
- Uterine size > POG
- Empty Uterus (DOUGHY)
- Respiratory distress due to Trophoblastic Embolization
- Patient may have Theca Lutein cysts
- Early onset HTN (d/t abnormal Trophoblastic proliferation)

## MANAGEMENT OF VESICULAR MOLE / COMPLETE MOLE 00:46:17

- Suction Evacuation (also do a Gentle curettage with a sharp curette)

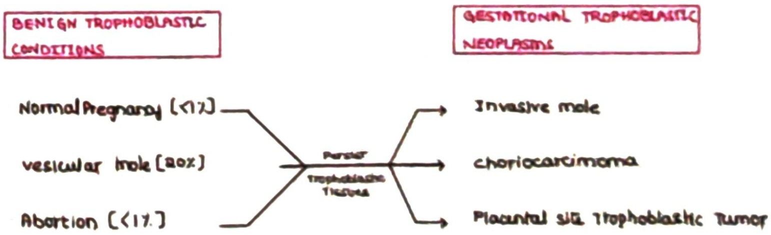
↓

- Do USG after a week to Rule out Retained Bits
- Do CXR to Rule out metastasis

  (MC site of metastasis → Lung)
- HCG follow up
  - Weekly HCG estimation till it is negative

    (Vesicular mole takes 9 wks & Partial mole takes 7 wks to come to negative value)
  - Weekly HCG till 3 more wks after it comes negative
  - Once in a month for 6 months (No pregnancy at this time)

    (Woman should use contraception at time of follow up)


BENIGN TROPHOBLASTIC CONDITIONS
GESTATIONAL TROPHOBLASTIC NEOPLASMS
Normal Pregnancy (<1%)
vesicular mole (20%)
Abortion (<1%)
Persistent Trophoblastic Tissue
Invasive mole
choriocarcinoma
Placental site Trophoblastic Tumor

Exception → Invasive mole does not follow a normal pregnancy

## INVASIVE MOLE/ CHORIOADENOMA DESTRUENS → Produces HCG

- Locally invasive (Does not give Systemic secondaries)
- Villi are preserved
- Sx is preferred Rx

## CHORIOCARCINOMA → Produces HCG

00:58:04

- Local + Systemic Invasion
- No villi seen
- Chemotherapy is mainstay of Rx
- Sx Treatment if age of patient is > 40 yrs

## Placental Site Trophoblastic Tumor (PSTT)

- Made by Intermediate Trophoblasts (Derivative of Cytotrophoblast) → Produces HPL
- Rx → Surgery
- Human Placental Lactogen follow up is done

## CHORIOCARCINOMA

- ↑HCG at Dx (> $10^5$)
- Uterine Size → Big
- 6cm Theca Lutein Cyst

} ↑↑chance of Choriocarcinoma

20% of Vesicular moles will become Choriocarcinoma
< 1% of Normal pregnancy will become Choriocarcinoma
< 1% of Abortions will become Choriocarcinoma

50% of Choriocarcinoma follow Vesicular mole
25% of Choriocarcinoma follow Normal Pregnancy (Worst Prognosis)
25% of Choriocarcinoma follow Abortion

01:02:20

- WHO PROGNOSTIC SCORING SYSTEM BAD PROGNOSIS

| | |
|---|---|
| – Antecedent Pregnancy | → Normal Pregnancy |
| – HCG | → $10^5$ or more |
| – Size of Tumor | → > 5cm |
| – Chemotherapy (No. of Drugs) | → 2 Drugs given |
| – Age | → > 39 years |
| – Metastasis | → Present at time of Diagnosis |
| – Metastasis | → In Liver or Brain |
| – Time Interval of appearance of Choriocarcinoma after Mx of Vesicular mole | → Longer |
| – Blood Group | → B |

- Score 7 → Poor Prognosis
- Management

Risk Factors of choriocarcinoma

| Risk factor | 0 | 1 | 2 | 4 |
|---|---|---|---|---|
| Age | = 39 | > 39 | | |
| Antecedent pregnancy | Hydatidiform Mole | Abortion | Term | |
| Interval (months) from antecedent pregnancy | < 4 | 4 to 6 | 7 to 12 | > 12 |
| Human Chorionic gonadotrophin (HCG) (IU/L)$^{a}$ | $<10^3$ | $-10^4$ | $-10^5$ | $>10^5$ |
| ABO blood group (female x male) | | O x A<br>A x O | AB | B |
| Largest tumor mass. including uterine(cm) | | 3-5 | >5 | |
| Site of Metastases<br>Number of metastases | | Spleen<br>1-4 | GI tract<br>5 - 8 | Brain<br>> 8 |
| Prior chemotherapy | | | Single drug | Two or more |

– < 7 Score

  ○ Single Agent (Methotrexate / Actinomycin)

  or

  ○ Combo (MTX + Actinomycin + Cyclophosphomide)

– ≥7 Score [(High Risk Patient) (High Risk Patient with

Metastasis)]

- ○ ETOPOSIDE
- ○ MAC (MTX + Actinomycin + Cyclophosphomide)
- ○ Oncovin (Vincristine)

## STAGING OF MOLAR DISORDERS 01:08:35

- Stage I → Within Uterus
- Stage II → In Pelvis, Vagina (Do not take biopsy until HCG done)
- Stage III → Lung
- Stage IV → Distant Metastasis

## Chapter 7

# ANTE PARTUM HAEMORRHAGE

- Any bleeding in the genital tract after >28 Weeks (Viability) of gestation 00:00:15

CAUSES:

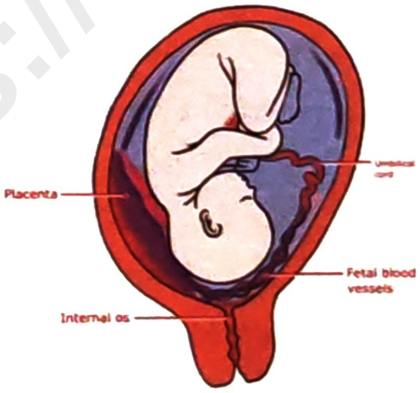
- Vasaprevia
- Placenta Previa
- Abruptio Placentae

## PLACENTA PREVIA (PP) 00:02:16

- 1 in 300-400 pregnancy

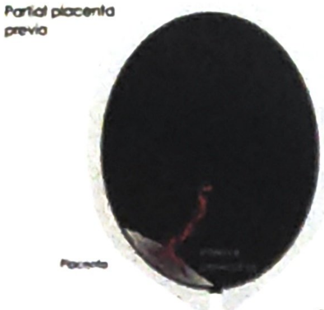
Associated with

- Multiparous
- Twins, triplets
- Previous C.S
- Previous Hysterotomy
- Myomectomy



## CLASSIFICATION

- Placenta previa
- Partly



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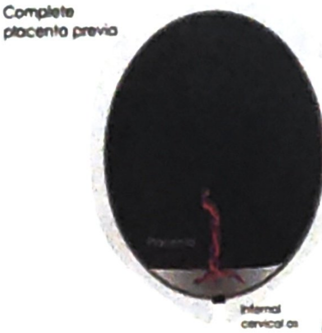

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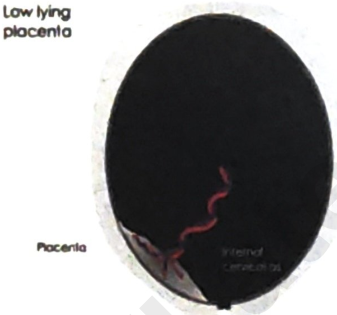
- Completely
  - Low lying placenta within 2 cm of the OS



[redacted]

## PRESENTATION

- Only presentation is → Painless bleeding P/V (NOT FOR ALL)

## DIAGNOSIS

- 3D USG (in full bladder, Doppler assisted)

## MANAGEMENT

- PP Bleeding at term (37 to 42 wks) → C.S
- No P/V examination → ↑↑Bleeding
- PP at Term 37-42 wks (Not Bleeding)

○ PP → $\left.\begin{matrix}\text{Partly}\\ \text{Totally}\end{matrix}\right\}$ C.S

- ○ Partly Covering → Double set-up examination
- At term: Low lying placenta → Trial of normal delivery
- If posterior low lying → Look out for fetal HR ↓↓ with contractions

Q PP Bleeding at 32 wks

A
- Resuscitation + Rest (High Risk Ward) + Steroids (Fetal Lung Maturation)
  - ○ Tocolysis increases bleeding
- Conservative Mx → Mc affee Jhonson Regime
  - ○ In 90% cases bleeding ↓↓ then stops
    (First episode of bleeding mostly stops)
- If bleeding continues → C.S

Q Bleeding at 32 wks, PP

+ IU Fetal death
± Fetal anomalies
± Maternal unstability

} Contra Indication to conservative Mx

(Transverse Lie → Not a contra indication to conservative Mx)

| | |
|---|---|
| PP | PP |
| Bleeding, 32 wks | Preterm labour |
| Mc affee Jhonson → yes | 32 wks |
| Tocolysis → no | Tocolysis → Yes |

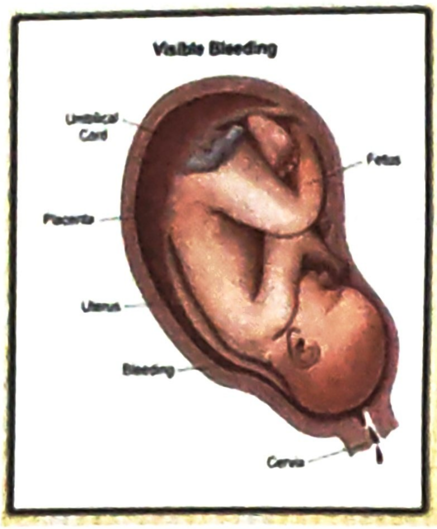
## ABRUPTIO PLACENTA/ ACCIDENTAL HAEMORRHAGE 00:40:41

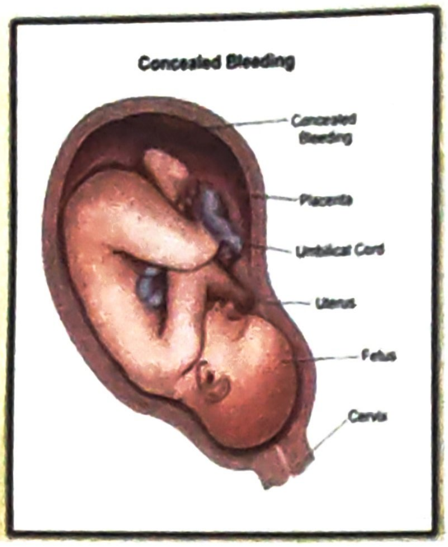
1 in 200 Pregnancies

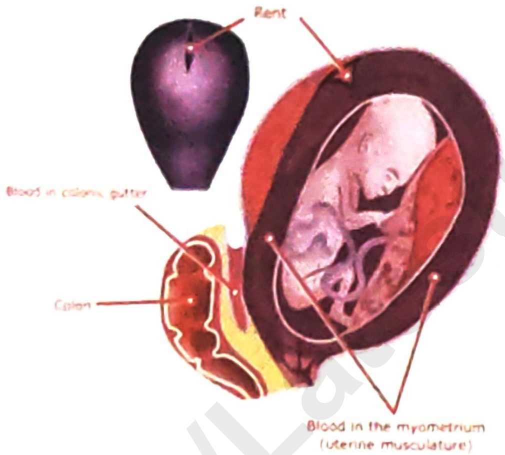
### ASSOCIATED WITH

- Hypertension, Pre eclamptic toxemia
- Smokers
- Elderly Gravida
- Multiparous women
- Pre Mature Rupture of Membranes
- Chorioamnionitis
- Previous abruption
- Thrombophillias

- Twins







## PRESENTATION

- Painful bleeding
- Protraction of labour
- PPH

(Indication of obstetric hysterectomy)

## MANAGEMENT

1. AT TERM (37-42 wks)
   - Resuscitation
   - If fetal distress +nt
   - FHR <110 on doppler

- Fetal Scalp blood PH is <7.2
- Cesarean Section

- Abruption per se is not an indication for cesarean section → Normal delivery

NORMAL DELIVERY IN ABRUPTION →A.R.M

→ By ARTIFICIAL RUPTURE OF MEMBRANES

- Local prostaglandins are released → Induce labour
- The compression stops the bleeding

→ Loss of fetal movements →Inability to localize FH sounds

→ Can also add oxytocin → Augments labour

2. At 32 weeks
   - Resuscitation, High Risk Vigillance
   - Steroids to Mother
   - Sedation, Rest
   - No C.S
   - Do ARM, give oxytocin & Deliver the Baby
   - No Tocolysis

Blood Clot
↓(wait is too long)
Tissue Thromboplastin
↓
Extrinsic coagulation casacade
↓
Consumptive coagulopathy
↓
DIC
↓
Death

| NO TOCOLYSIS IN APH |
|---|
| • Placenta previa<br>• Abruptio placenta<br>• Vasa previa |

Q. Condition in APH where conservative Mx is useful, < 34 wk → -

placenta previa

### CONTRA INDICATIONS TO CONSERVATIVE MX

- Intra Uterine Death
- Anomalous Baby
- Severe Shock of Mother
- Abruption
- Vasa previa

Q. PP, 32 weeks of Gestation with pre term labour.

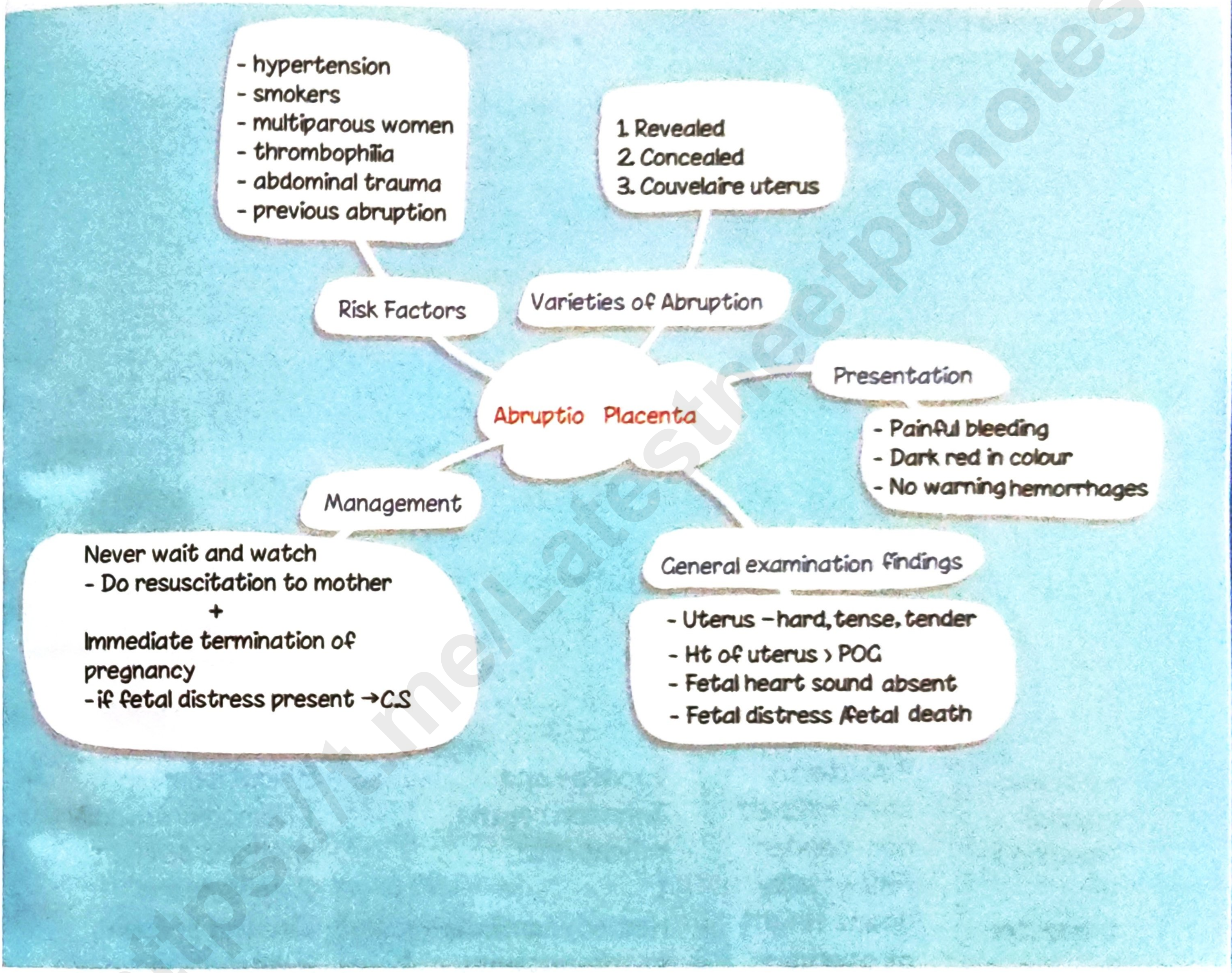
a. Tocolysis cannot given

b. Tocolysis can be given

A. If no bleeding in placenta previa, tocolysis can be given

### SHER & PAGE CLASSIFICATION

| Grade | Vaginal Bleeding | Uterine Tetany | Fetal Distress | Maternal Shock | USG |
|---|---|---|---|---|---|
| 0 | - | - | - | - | RPC: Small |
| 1 | + | +/- | - | - | +/- |
| 2 | +/- | +/- | + | - | +/- |
| 3 | +/- | + | Fetal Demise | + With possible DIC | +/- |



**Abruptio Placenta**

**Risk Factors**

- hypertension
- smokers
- multiparous women
- thrombophilia
- abdominal trauma
- previous abruption

**Varieties of Abruption**

1. Revealed
2. Concealed
3. Couvelaire uterus

**Presentation**

- Painful bleeding
- Dark red in colour
- No warning hemorrhages

**General examination findings**

- Uterus – hard, tense, tender
- Ht of uterus > POG
- Fetal heart sound absent
- Fetal distress /fetal death

**Management**

Never wait and watch
- Do resuscitation to mother

+

Immediate termination of pregnancy
- if fetal distress present → CS

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## Placenta previa

- Risk factors
  - previous history of placenta Previa (mc)
  - history of C- section (2nd mc)
  - placenta succenturiate
  - placenta bilobate
- Classification
  - Placenta previa
    - Partly
    - Completely
  - Vasaprevis
  - Abruptio placentae
- Presentation
  - painless vaginal bleeding in 3rd trimester
  - Idiopathic
  - warning hemorrhage +
- General examination
  - P/A: uterus soft, relaxed non-tender
  - FHS – asily heard Height of uterus = POG
  - FHS –+
  - IOC- TVS
- Management
  - Expectant Mx
    - "mcafee and Johnson regime"
    - Indications:
      1. Hemodynamically stable patients
      2. bleeding has stopped
      3. gestation ≤ 36 weeks
  - Active Mx (terminate pregnancy)
    - Indications:
      1. hemodynamically unstable patient
      2. continuous bleeding present
      3. gestational age ≥ 37 weeks
      4. fetal distress positive

## Chapter 8

# Hypertension in Pregnancy

### GESTATIONAL HYPERTENSION 00:00:39

- After 20 weeks of gestation in a previously Normotensive woman, BP › 140/90 mmHg, in › 2 occasions › 6 hrs apart

### PRE ECLAMPTIC TOXEMIA (PIH - earlier name) 00:01:28

- Hypertension › 140/90 after 20 weeks with:
  Protenuria › 300 mg/ 24 hr urine or 1+ in dipstick
  Protein: creatinine Ratio $\geq 0.3$

### ECLAMPSIA

- Pre Eclamptic Toxemia with Generalized Tonic Clonic convulsions

- Signs of Severe HTN or Imminent Eclampsia
  - Headache 00:03:40
  - Nausea/ Vomiting
  - Blurring of vision
  - ↑ Knee Jerks
  - Epigastric pain
  - Proteinuria → › 2 gms/ 24 hrs urine
  - * (› 3.5 gm/24 hrs - Nephrotic range)
  - BP → › 160/110 mm Hg

### PRE EXISTING HTN 00:05:25

- Essential HTN
- Chronic HTN
  - Renal Artery Stenosis
  - Pheochromocytoma

- Acute on chronic HTN 00:07:21
  - Platelets → ‹100,000
  - Creatinine → ›1.1
  - New onset Proteinuria
  - Liver Transminases › 2 times
- Delta HTN 00:09:40
  - BP is normal through out the pregnancy and it reaches high normal values in the later stage pregnancy.
  - Can be associated with convulsions

ECLAMPSIA MANAGEMENT 00:11:35

- DOC → $MgSo_4.7H_2O$
  - IM + IV (PRITCHARD'S REGIMEN- Method of Choice)
  - IV only (ZUSPAN REGIMEN)

→ Pritchard's Regimen

- IV $MgSo_4$ 4 gms
  IM $MgSo_4$ 10 gms (5gms in each buttock)
  IV $Mg\,So_4$ 2 gms added if no relief
- Follow up with
  - ○ IM $MgSo_4$ for 24 hrs after the last convulsion or the delivery whichever is later.
  - ○ Monitor Knee Jerks → +
    Respiratory Rate → ›14/min
    Urine output → ›100 ml/4 hrs

- Delivery is the most important step in the Mx of Eclampsia
- 90% or more are Normotensive within one week of delivery
- Add IV Labetelol → DOC for Hypertensive emergencies in pregnancy
  - 20 mg iv over 10 min

↓

Another 20/40 mg over 10 min

↓

80 mg in 10 min

↓

upto 220 mg (Max.)

- α + mg Blocker (LABETALOL)

- IV HYDRALAZINE
  - 5 to 10 mg IV Bolus
  - Alternative to Labetalol

- GUDEL's AIRWAY
  - Prevents the tongue bite
  - Maintains the oxygenation
  - Do not use mouth gags etc.

HYPERTENSION MANAGEMENT 00:27:03

- Tab. LABETELOL
  - 1st Line drug
  - 100 - 200 mg TID
  - α + β blocker

- Tab METHYL DOPA
  - Prodrug
  - Active form → Methyl Norepinephrine
  - 250 - 500 mg QID

- Tab. HYDRALAZINE
  - 25-50 mg BD or OD
  - Arteriolar dilator

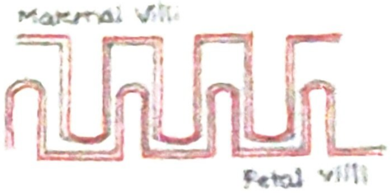
- TAB NIFEDEPINE
  - S/L Nifedepine is C/I (can cause sudden Hypotension when taken sub lingually)
  - 10 mg TID (upto 80 mg/ day can be given)

- Tab PRAZOSIN
  - α Blocker
  - 2.5 - 5 mg/ day

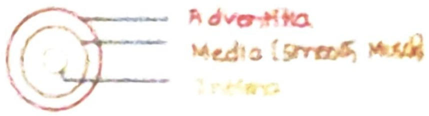
## CONTRA INDICATED DRUGS

00:29:56

- Furosemide
  β Blockers
  Ace Inhibitors } cause Intra Uterine Growth Restriction



- Ace inhibitors can cause
  - Hypocalvaria
  - Renal Agenesis
  - Oligoamnios



## Etiology of HTN

00:31:50

- > 20 wks, trophoblastic invasion & Replacement of smooth muscle layer of Spiral Arterioles } Ⓝ
- Persistence of smooth muscle layer or inadequate Trophoblastic invasion } Vaso- spasm
- Vasospasm (Pathology) → HTN (PIH)
- As Furosemide → ↑ Vasospasm → Contraindicated
- Normal SALT DIET

- Pathology of PIH is Vasospasm
- Anti hypertensive drugs have to be started → ≥150/100 mmHg

## Other Associates of PIH

00:43:38

- 1st exposure to Villi (Primigravida)
- More exposure to Villi (Twins, Molar pregnancy)
- Pre existing endothelial damage
  - Renal Disease
  - DM
- Genetic Predisposition
  - Altered function of Methyl Tetra Hydrofolate Reductase (MTHR) gene
  - Factor V leiden abnormal function
- ↓ Nitric Oxide production from endothelium by L. Asparginase

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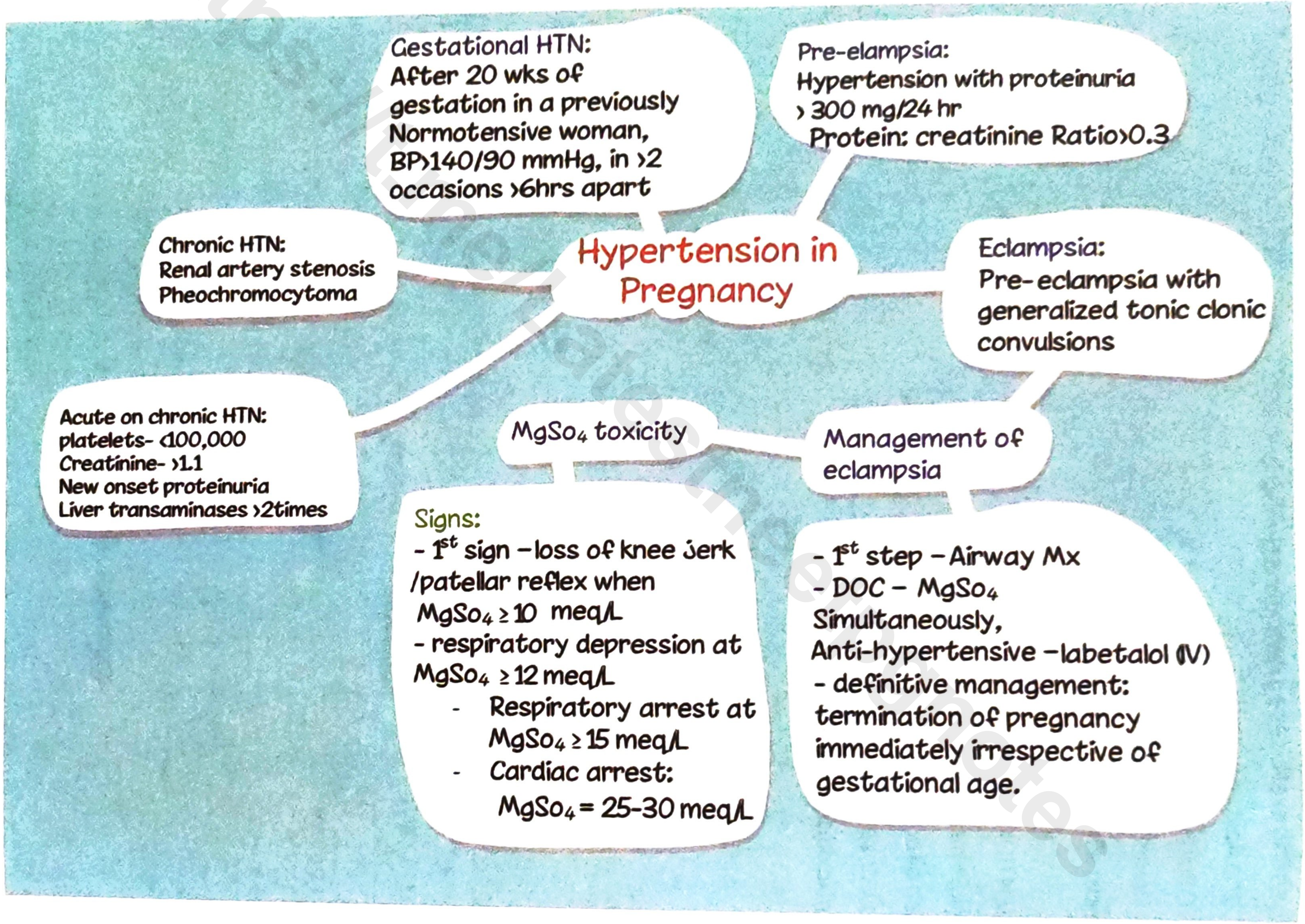
## PREDICTION OF HTN

- Roll over Test → > 10 mm Hg increase
- Isometric exercises eg Persistent Hand grip
- ↑ Uric Acid
- ↓ Calcium
- ↑ Homocysteine
- Micro albuminuria

## PREVENTION

- Calcium supplimentation
- Fish oil capsules
- Low dose Aspirin (75-150 mg)
- Antioxidants (Vit C/D/E)



## Hypertension in Pregnancy

**Gestational HTN:**
After 20 wks of gestation in a previously Normotensive woman, BP>140/90 mmHg, in >2 occasions >6hrs apart

**Pre-elampsia:**
Hypertension with proteinuria > 300 mg/24 hr
Protein: creatinine Ratio>0.3

**Eclampsia:**
Pre-eclampsia with generalized tonic clonic convulsions

**Chronic HTN:**
Renal artery stenosis
Pheochromocytoma

**Acute on chronic HTN:**
platelets- <100,000
Creatinine- >1.1
New onset proteinuria
Liver transaminases >2times

**Management of eclampsia**

- 1st step – Airway Mx
- DOC – $MgSO_4$

Simultaneously,
Anti-hypertensive – labetalol (IV)
- definitive management: termination of pregnancy immediately irrespective of gestational age.

**$MgSO_4$ toxicity**

Signs:
- 1st sign – loss of knee jerk /patellar reflex when $MgSO_4 \geq 10$ meq/L
- respiratory depression at $MgSO_4 \geq 12$ meq/L
  - Respiratory arrest at $MgSO_4 \geq 15$ meq/L
  - Cardiac arrest: $MgSO_4 = 25\text{-}30$ meq/L

## Chapter 9

# GESTATIONAL DIABETES MELLITUS

### Priscilla White's Classification 00:00:25

Gestational DM (A)

Category $A_1$ -Sugar controlled with Diet

Category $A_2$ -Sugar controlled with Insulin

Pre Gestational DM/ Pre-existing DM/ Overt DM

Category B → < 10 years of duration
Category C → 10-19 years of duration
Category D → >20 years of duration
Category F → Associated with nephropathy
Category R → Associated with Retinopathy
Category H → Associated with Heart disease

### American Diabetic association (ADA) Classification

2 Types

Type 1

- Destruction of Pancreatic Islets
- Reduced Insulin available

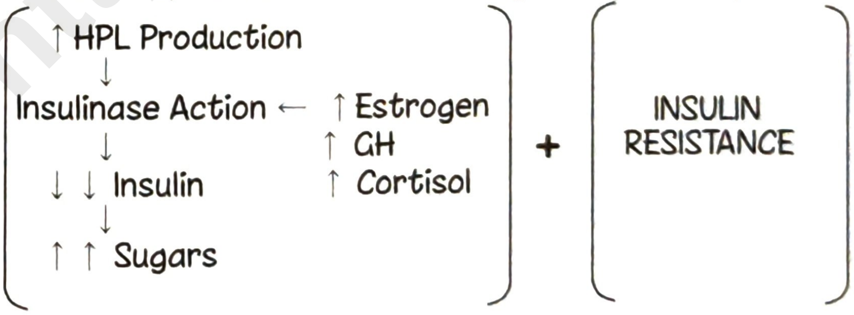
Type 2

- Insulin is available but there is insulin resistance

Note:- IDDM & NIDDM are not used now

### Gestational DM 00:04:28

- Presents around 24 wks so screening done ≥ 24 wks
- At 24 wks, Human Placental lactogen made from placenta



- No anomalies (organogenesis over) i.e. GDM does not cause Anomalies

→ Screening of GDM 00:06:17

- Done after 24 wks
- Glucose challenge test with 50 gms of sugar in a non fasting woman → screening test (obsolete now)

- Values after 1 hour should be < 140 mg/dL
- If values > 140 mg/dL → ? GDM

↓

Do confirmatory test → GTT with 100 gm glucose

- If values > 200 mg/dL → Diagnostic of GDM

- Glucose tolerance test (GTT) with 100 gms of sugar in a fasting woman → Diagnostic test (Obsolete now)

- Fasting value → < 105 mg/dL

↓

Give 100 gm of sugar/ Glucose to patient

1 hr value < 190
2 hr value < 165
3 hr value < 145

Any 2 or more abnormal values
↓
Diagnostic of GDM

- 1 Step Test → Glucose tolerance test with 75 gms of sugar in a fasting woman (Screening & Diagnostic test now)

- Fasting → < 92
- At 1 hr → < 180
- At 2 hrs → < 153

Any one abnormal valve
Is Dx of GDM

Diabetes in pregnancy study group of India (DIPSI) guidelines

- Non- fasting woman

↓

Given 75 gm of Glucose load

↓

After 2 hrs, sugar values are estimated

| Sugar value | Interpretation |
|---|---|
| > 140 | GDM |
| > 120 | DGGT (Deranged Gestational Glucose Tolerance) |
| > 200 | DM |

Pre Gestational DM/ Overt DM

1st trimester = period of organogenesis

1st trimester ↑ sugars is directly proportional to Anomalies

- Therefore screening of DM is must in 1st trimester

Screening is done by

- Glycosylated Hb ($HbA_1C$) → < 6.5%
- Serum fructosamine → 258-288 µmol

* Serum fructosamine is done in case of abnormal RBC's conditions like Sickle cell Anemia

Maternal Complications 00:20:31

- → Large baby → ↑ cesarean section
  - ↑ Instrumentation (forceps and vaccum)
  - ↑ Birth canal injuries
  - Shoulder dystocia
  - PPH
- → Polyhydramnios → PROM → Chorioamnionitis
- → Peurperal sepsis
- → Preterm labour
- → Associated with Pregnancy induced Hypertension (PIH) → 25% cases
- → Abruption

→ Sudden intra uterine death at term

↓

Due to

1. Poor glycaemic control
2. Fetal lactic acidosis
3. Maternal ketoacidosis
4. Diabetic vasculopathy

Secondary to villous edema

↓

Compromises blood supply of fetus leading to sudden death

Newborn Complications

00:24:46

→ Hypoglycemia

↑Sugar in mother

↓

Reach fetus

↓

Fetus has healthy pancreas which makes increased insulin to metabolize sugars (also there is increased IGF which leads to Macrosomia)

↓

When baby is born → ↑ Insulin in baby → Leads to Hypoglycemia

* There is β – cell pancreatic Hyperplasia in the fetus

→ Hypomagnesemia

→ Hypocalcemia

→ Polycythemia

→ Hyper bilirubinemia

→ Anomalies

- Cataract in newborn
- Cardiac (MC group of anomalies)
  - Transposition of great vessels (MC & most specific)
  - VSD
  - PDA
- Neural tube defects
  - Anencephaly
  - Spinal Bifida
  - Facial defects - cleft palate, cleft lip

- Structural defects → Sacral Agenesis / caudal regression syndrome (Most Specific Rare Defect)
- Most specific defect in Overt DM TGA > Sacral agenesis

Management 00:35:40

| | | |
|---|---|---|
| Diet | 25-30 K. cal. /kg/D<br>[Normal requirement → 35-40 K. cal/kg. D] | |
| Monitor Sugars | - Fasting /2 hrs Post break-fast / 2 hrs Post Lunch / 2hrs Post Dinner on a daily basis in the hospital<br>- Once sugar values are settled → Patient is discharged<br>- After discharge, sugar profile is done once a week<br>- Targets of proper Glycaemic control<br>◦ Fasting sugar value < 95<br>◦ Post prandial sugar value < 120 | |
| Monitor Fetus | Antepartum surveillance<br>- DFMC (Daily Fetal Movement Count)<br>- NST<br>- BPP (Biophysical profile)<br>- Umbilical Artery Doppler | |
| DOC | Insulin | |
| OHA (Oral Hypoglycemics) | Glyburide (Glibenclamide)<br>Metformin | |
| Fundus Examination | Look for Retinopathies | Background (80%) → can deliver normally |
| | | Proliferative (20%) (Neovascularization)<br>↓<br>In labor (↑ IOP)<br>↓<br>Can lead to Retinal detachment<br>↓<br>Therefore labor is C/I in Proliferative Retinopathy |

*Medical Nutritional therapy → Diet

A good diet has

Carbohydrates → 50%
Proteins → 30%
Fats → 20%

These proportions are maintained in both normal as well as DM pregnancy

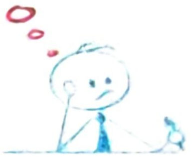
## Fetal lung maturity is delayed in DM pregnancy

- Steroids are given for lung maturity
- Steroids increase maternal sugar so are given preferably after admission into hospital

## → Timing of Delivery

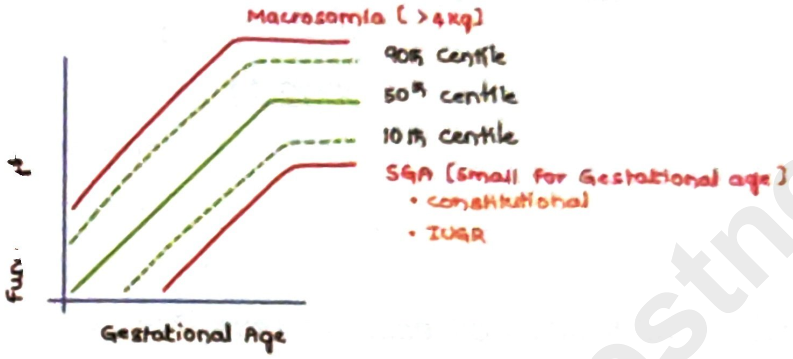
- GDM well controlled on diet alone → 40-41 wks
- GDM requiring medication → 38-39 wks (< 39 wks)
- Overt DM (Type 1 or 2) → well controlled → 37 wks (Max. 39 wks)
- Overt DM not well controlled → 34 wks (< 37 wks)

## Chapter 10



# INTRA UTERINE GROWTH RESTRICTION

- Clinical lag of 2-3 weeks fundal height corresponding to gestational age



- Weight < 2.25 kg (2.3 kg) &

  FL: AC Ratio ≅ 22 after 21 weeks (Ⓝ)

  → 23.5 → S/O IUGR

  FL = Femoral length; AC = Abdominal circumference
- 1st Parameter affected during growth restriction
  - Abdominal circumference
- 2nd Parameter affected during growth restriction
  - Upper & lower limbs
- Last parameter affected during growth restriction
  - Brain (d/t preferential circulation)

## Symmetrical vs Asymmetrical IUGR 00:09:10

| Symmetrical IUGR/ Type 1 | Asymmetrical IUGR / Type |
|---|---|
| - Early onset | - Late onset |
| - d/t<br>1) Infections<br>2) Chromosomal disorders<br>3) Congenital anomalies | - d/t<br>1) HTN<br>2) Renal Disease |
| - PONDEREL INDEX (PI)<br>PI = Estimated fetal weight/FL$^3$<br>(FL- Femur Length)<br>Normal value = 8.3 | - PONDEREL INDEX → < 7 |
| - HC/AC → 1 Ⓝ | - HC/AC → > 1 |
| - Poor Prognosis | - Better Prognosis |

## Etiology 00:12:23

- Idiopathic (65%)

### Maternal causes

- Chronic kidney disease, HTN, Infections, Connective tissue disorders, Heart disease (NYHA type III & IV), Smoking, Drugs, Alcohol, Burnt out DM (with Microangiopathy/ Vasculopathy)

### Placental causes

- Placental infarcts, Abnormal placentas, Abnormal placentation

### Fetal Causes

- Inborn Errors of metabolism, Chromosomal anomalies, Infections

## Fetal Complications 00:17:06

- Antepartum
  - Oligoamnios
  - Hypoxia
  - Still birth
- Intra Partum
  - Hypoxia
  - Acidosis

### Neonatal Complications

- Limp, Loose skinned, Thin, Poor Tone
- Respiratory Distress Syndrome
- Intra Ventricular hemorrhage
- Neonatal death
- Persistence of primitive circulation

### Management 00:21:49

- Not the treatment 00:25:44
  - ↑ Diet
  - Protein powders
  - Stopping to smoke
  - Stopping to Drink
  - Stop using drugs

### Treatment

- Resting in a lateral position (Only proven method, which ↑ the weight)
- ↑ Surveillance
- Adequate diet required for women
  - Calories → 35-40 Kcal/day
  - Carbohydrates → 50%
  - Proteins → 30%
  - Fats → 20%

## ANTEPARTUM FETAL SURVIELLANCE IN HIGH RISK PREGNANCY

- Examples of High Risk Pregnancy 00:32:30
  - IUGR
  - PIH
  - APLA
  - GDM
  - Epilepsy in pregnancy
  - Twin pregnancy
  - SLE
  - Heart disease
  - Malaria etc.

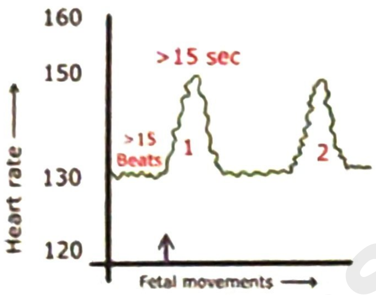
## Tools

Daily Fetal Movement Count (DFMC)

→ >10 movements /12 waking hours (Normal)

Non Stress Test

- Sympathetic Vs Para sympathetic system well being
  - Established at 28 wks
  - Test will be done 32 wks onwards
- Reactive Non stress Test
  - ≥ 2 accelerations, > 15 Beats from baseline
    > 15 seconds in 20 minutes
  - Chance of IUD → < 1% / next 1 week



Acceleration ≥2/20 min

- Frequency of NST
  - Weekly after 32 wks, for all pregnant female
  - Biweekly for high risk pregnancies
  - Once in 48 hrs for controlled DM & severe HTN
  - Daily for uncontrolled DM

Bio Physical Profile/ Manning Score 00:41:31

- Done by USG → 2
- Fetal movements

Fetal tone → 2

Fetal breathing movements → 2

Adequate NST → 2

Amniotic Fluid Index → 2

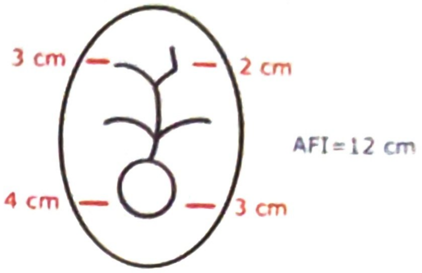
Total Score = 10

Good Biophysical Profile → 10/10

## Amniotic Fluid Index

00:43:51

- Arithmetic sum of 4 cord free pockets
- Normal → 10-15 cm
  Oligoamnios → <5 cm
  Polyhydramnios → >24 cm



## Absolute Amount of Liquor

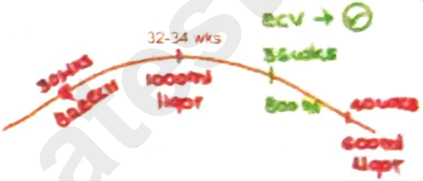
- Normal → 1000 ml
  Oligoamnios → 500 ml
  Polyhydramnios → >2000 ml

## Single Pocket

→ Oligoamnios → <2 cm
Polyhydramnios → >8 cm

### External Cephalic Version Done At

For Primigravia at → 36 wks
For Multigravida at → 37 wks



## Modified Bio Physical Profile

00:51:51

- Includes AFI & NST

## Vibro Acoustic Stimulation Test

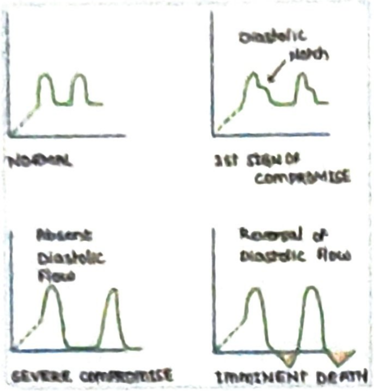
- **Definition:** It is a simple, non-invasive technique where a device is placed on the maternal abdomen over the region of the fetal head and sound is emitted at a pre-determined level for several seconds

  ↓

  This results in Startle reflex in fetus resulting in subsequent FHR acceleration which is a marker of reassurance of fetal wellbeing
- Not a part of BPP or Modified BPP
- It is also a test of fetal assessment

## Doppler of Blood Vessels 00:54:06

- Umbilical arteries
  Uterine Arteries
  Ductus venosus
- Most important Doppler for assessment of Uteroplacental flow } Umbilical Artery Doppler



Q. Which of the following flow patterns done by Doppler assessment will best signify perfusion to the baby?

A. Ductus Venosus Flow Patterns > Umbilical Artery Doppler

* Single best measure to assess the Uteroplacental flow → Doppler of Ductus Venosus

## CONTRACTION STRESS TEST / OXYTOCIN STIMULATION TEST 01:00:52

- Tells the plausibility of doing a normal vaginal delivery

## INTRAPARTUM SURVEILLANCE 01:02:34

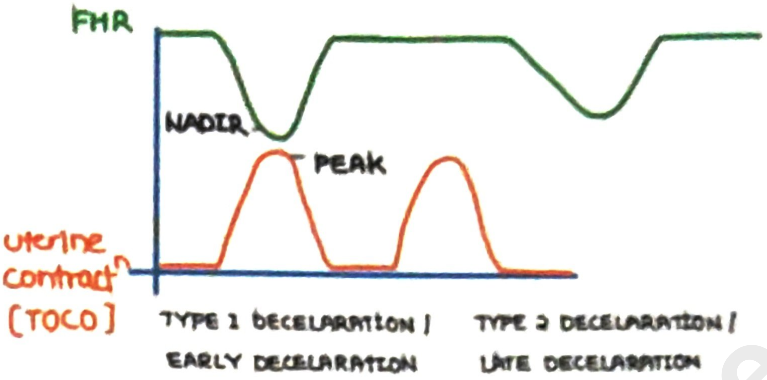
Fetal Heart Rate → By Stethoscope
→ By Doppler

Fetal Scalp Blood PH → 7.2

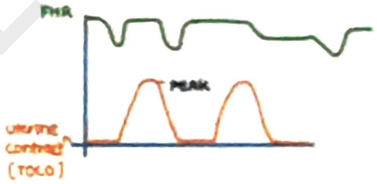
Fetal ECG
  - 1 Probe ECG → ST wave analysis (STAN)
  - 2 Probe ECG

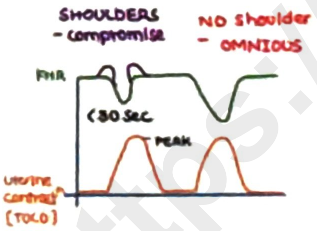
## CARDIOTOCOGRAPHY 01:05:09

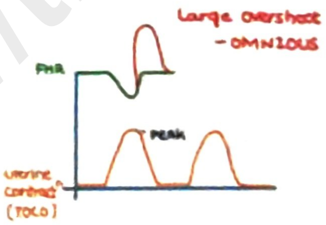
- Single best test for monitoring labor
- TYPE 1 / EARLY DECELERATION
  - The Nadir of FHR & Peak of Uterine contraction are close to each other
  - Seen in Normal Pregnancies
  - Onset of deceleration & coming back to normal → > 30 sec

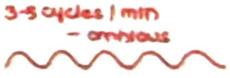


- TYPE 2/ LATE DECELERATION
  - The Nadir & Peak are away from each other
  - Seen in placental insufficiency
  - Onset of deceleration & coming back to normal → > 30 sec
- VARIABLE DECELERATION
  - Most common deceleration
  - d/t Umbilical cord compression
  - More patterns









SING WAVE
[SINUSOIDAL]
d/t Fetal anemia
Mx → C. Sect$^n$

* Deceleration - Reduction of heart rate by > 15 beats from baseline lasting for 15 seconds

## Chapter 11

# MEDICAL ILLNESS COMPLICATING PREGNANCY

### HEART DISEASES

**RHEUMATIC HEART DISEASE (RHD)** 00:00:58

- MC Heart Disease in INDIA
- Mitral stenosis (MC presentation)
  - Failure → Antenatal (around 30-32 wks) [MC]
    - ○ CO ↑ by 50%
  - → Postnatal → 1st 24 hrs
    - ○ CO ↑ by 70-75%
- Mx
  - Antenatal failure is managed by Balloon Mitral Valvotomy (Non invasive Sx) in 2nd trimester
  - Postnatal failure Mx
    - →Keep in High risk ward/ ICU for observation [for 1st 24 hrs]
    - →Inj. Lasix → ↓ Preload

- Observation Period Required Postnatally For Heart Disease
  - 1st 24 hrs
- Observation Period Required Postnatally For PPH
  - 1st Hour

- Labor induction is safe in most of the heart diseases
- Normal delivery can be done

## CESAREAN SECTION INDICATIONS 00:06:38

- Obstetric indications
- AORTIC root dilatation → > 4 cm
- AORTIC Aneurysms
- Severe AORTIC stenosis
- Recent MI
- Congestive Heart Failure
- Warfarin Rx within previous 2 weeks

## LABOUR MANAGEMENT 00:07:58

- ↓ IV Fluids
- Position → SEMI RECUMBENT
- Pain Relief
  - Opioids
  - Epidural Analgesia
- Avoid straining in 2nd stage
  - Cut short it by forceps / Vaccum

- Inj. Furosemide → ↓ Preload
  IV/IM Oxytocin → DOC for prevention of PPH } Given immediately after labor

  Methyl Ergometrine → Contraindicated
- Observation in High Risk ward for 24 hrs.
  Do not discharge for 5 – 7 days

## Delayed Complications 00:11:25

- Arrythmias
- Cardiac rupture
- Infective Endocarditis
- Thrombo Embolic Phenomenon
- Mitral Valve Prolapse

## Contra Indications to Pregnancy 00:13:01

- Eisenmengher syndrome
- Severe AORTIC stenosis

- Primary Pulmonary HTN
- Marfan syndrome involving AORTIC Root

* Coarctation of AORTA is not a contra indication for pregnancy

* However C-Section is indicated in Coarctation of AORTA

## HYPOTHYROIDISM

00:15:03

VALUES

- TSH → < 2.5 (Normally)

Value [> 2.5 - < 4.0] → Check Anti thyroid peroxidase

↓

If +ive → Start Eltroxin

| Maternal Complications 00:16:29 | Neonatal Complications 00:17:10 |
|---|---|
| - Abortion<br>- Preterm labor<br>- Pre-eclamptic toxemia<br>- Abruption<br>- PPH | - ↑ Morbidity & Mortality<br>- Cretinism<br>- ↓ IQ<br>- Neuro Psychiatric Illness<br>- Poor cognitive development<br>- Deafness & growth restriction |

## HYPERTHYROIDISM

MATERNAL COMPLICATIONS

00:18:37

- Pre Eclamptic Toxemia
- Thyroid Storm
- Preterm labor
- High output Cardiac failure
- Intra Uterine Growth Restriction
- Intra Uterine Death

Management

00:19:15

- DOC → Propylthiouracil ; Dose = 100 - 150 mg TID
- Methimazole [2nd Trimester onwards]

## EPILEPSY

00:20:02

- 30% have ↑ convulsions
  20% have ↓ convulsions
  50% have unchanged convulsions

## MANAGEMENT

- Phenobarbitone → Not given

Phenytoin
Carbamazepine } Given, but category D Drugs so can cause Fetal Hydantoin Syndrome

Lamotrigine (DOC)
Levitiracetam } Category C Drugs

### Situation 1

- If any female is on Phenytoin/ Carbamazepine (Category D Drugs) & is planning to Conceive

↓

- Change the Anti-epileptics from category D to category C i.e. Lamotrigine atleast 3 months prior to pregnancy
- Preferably don't give category D drugs to young women who are planning pregnancy in next 2-3 yrs

### Situation 2

- A female is 9 weeks pregnant & is taking Phenytoin for epilepsy

↓

- Continue the drug (Phenytoin) for rest of pregnancy
- No benefit of changing drug as most of organogenesis has occured & effects of Phenytoin have already taken place

00:27:58

## MALARIA

- Poor Prognosis
- ↑ Risk for Fulminant Hepatic Failure & Intra Uterine Death

## MANAGEMENT

- DOC → Chloroquine
- Complicated Malaria
  - Artesunate (DOC)
  - Quinine
  - Mefloquine (> 12 wks)

Rheumatoid Arthritis → Better prognosis

Sarcoid → Better prognosis

Ulcerative Colitis
00:29:45
→ Unchanged (If patient already has disease)
→ Worse prognosis (If 1st time presentation in pregnancy)

Appendicitis
→ Poor Prognosis
→ ↑ ed Abortion, Sepsis, Preterm Labor & IUD
→ Early surgery advised

Tuberculosis
00:31:34
→ Worse prognosis
→ Worst in PUERPERIUM as compared to 1st, 2nd & 3rd trimester because of
  - ↑ ed demand
  - ↓ ed supply
  - Ongoing Immuno suppression
  - Low socio economic status
  - Over crowding, Poor Ventilation
  - Heat, Humidity

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# Chapter 12

# INFECTIONS IN PREGNANCY

## VERTICAL TRANSMISSION 00:00:46

- Refers to passage of an infectious agent from mother to her fetus through
  - The Placenta
  - During labor or delivery or
  - Breast feeding
- Risk Factors
  - Preterm rupture of membranes (PROM)
  - Prolonged labor
  - Obstetrical manipulations (Like Internal Podalic Version (IPV), Forceps, Vaccum may enhance the risk of Neonatal Infections)

## HORIZONTAL TRANSMISSION

- Spread of an infectious agent from one individual to other

## SECONDARY ATTACK RATE

- Probability that infection develops in a susceptible individual following contact with an infectious person.

## VIRAL INFECTIONS

## CYTOMEGALO VIRUS 00:01:50

- DNA Herpes virus
- MC perinatal infection in the developed world
- Upto 85% of poor and 50% of higher classes are seropositive by the time of pregnancy.
- Women who develop primary CMV infection during pregnancy [were seronegative before pregnancy], are at greatest risk to have an infected Fetus.

## MATERNAL INFECTION FEATURES

00:03:17

| 10-15% of infected adults have | Features of Immuno Compromised |
|---|---|
| - Mononucleosis - like syndrome<br>- Fever, Pharyngitis<br>- Lymphadenopathy<br>- Polyarthritis | - Myocarditis, Pneumonitis<br>- Hepatitis, Retinitis<br>- Gastroenteritis or<br>- Meningoencephalitis |

## TRANSMISSION RATES

- 30-36% in 1st Trimester
  30-40% in 2nd Trimester
  40-72% in 3rd Trimester

## FETAL INFECTION

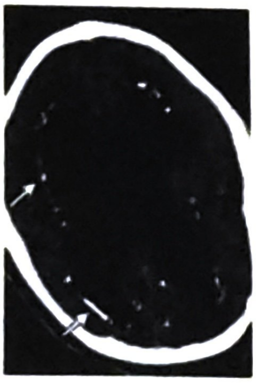
00:04:07

(Only 5-10% neonates demonstrate this syndrome)

| Features | Complications |
|---|---|
| - Growth restriction, Microcephaly<br>- Intracranial calcifications<br>- Chorioretinitis<br>- Mental retardation, Sensorineural deficits<br>- Hepatosplenomegaly<br>- Jaundice, Hemolytic anemia<br>- Thrombocytopenic purpura | - Hearing loss<br>- Neurological deficits<br>- Chorioretinitis<br>- Psychomotor retardation<br>- Learning disabilities |

## PERIVENTRICULAR CALCIFICATION

00:05:45



## DIAGNOSIS

**Nucleic Acid Amplification Testing (NAAT) of Amniotic Fluid**

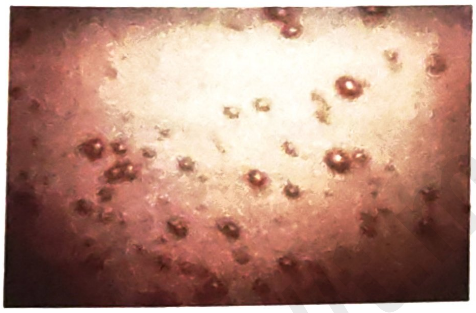
- Gold standard for Dx of Fetal infection

## MANAGEMENT

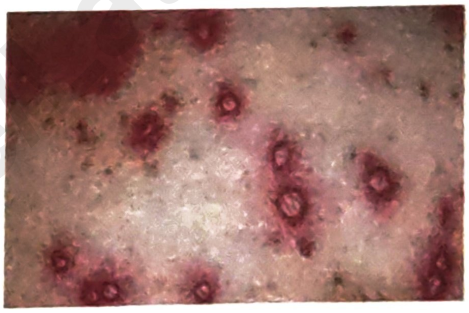
- Despite the high infection rate with primary infection in the 1st half of pregnancy, most Fetuses develop normally.
- If recent infection is confirmed → Offer Amniotic fluid CMV
- Pregnancy termination may be an option for some
  - Oral Valacyclovir 8gm daily is tried on mother
  - No Vaccine for CMV is available

## VARICELLA ZOSTER INFECTIONS 00:07:35

- 90% of adults have serological evidence of immunity
- Primary infection → Varicella or Chickenpox
- Transmitted by direct contact with an infected individual
- Incubation period → 10 to 21 days
- 1 to 2 days flu like prodrome followed by Pruritic Vesicular lesion that crust after 3 to 7 days
- Period of communicability → 1 day before the onset of rash until lesions become crusted



Vesicular Lesions



Crusts

## MATERNAL MORTALITY

- Predominantly d/t VZV (Pneumonia) in pregnancy
  - Risk Factors - Smoking, > 100 cutaneous lesions point towards poor prognosis
- If there is reactivation of primary Varicella years later, it leads to Herpes Zoster or Shingles
  - U/L dermatomal Vesicular eruption
  - a/w severe pain

not more frequent or severe in pregnant women

- Congenital Varicella syndrome rarely develops in cases of Maternal Herpes Zoster

## FETAL & NEONATAL INFECTION

### CONGENITAL VARICELLA SYNDROME

- The highest risk is b/w 13-20 weeks
- Clinical Features
  - Chorioretinitis
  - Microphthalmia
  - Cerebral Cortical atrophy
  - Growth restriction
  - Hydronephrosis
  - Limb hypoplasia
  - Cicatrial Skin Lesions
- After 20 weeks of gestation, no clinical evidence of Congenital infection

### AROUND DELIVERY

- Active infection just before or during delivery (before Maternal antibody formed) is a serious threat.
  - Neonatal mortality rate is 30%
  - Disseminated Visceral & CNS disease is commonly fatal.
  - Varicella Zoster Immunoglobulin (VZIG) should be administered to neonates born to mothers who have clinical evidence of Varicella - 5 days before & up to 2 days after delivery.

## DIAGNOSIS OF VARICELLA

### MATERNAL

- Clinical diagnosis
- Confirmed by NAAT of vesicular fluid
- Scraping the Vesicle base & go for Tzanck smear, Tissue culture or Direct Fluorescent antibody testing

FETAL → Congenital Varicella Dx with NAAT of Amniotic fluid

## MANAGEMENT

### MATERNAL EXPOSURE

- Exposed pregnant women who are seronegative should be given VZIG
  - Best given within 96 hrs of exposure
  - Can be given up to 10 days

### ESTABLISHED MATERNAL INFECTION

- IV ACYCLOVIR therapy (at 10-15 mg/kg every 8 hrs) with hospitalization.

## INFLUENZA 00:13:44

- Pregnant women are more susceptible to serious complications especially d/t Pulmonary Involvement.
- Orthomyxoviridae → RNA virus → both Influenza A & B cause Epidemics
- Influenza A is not related with congenital malformations
- Viremia is infrequent
- Transplacental passage is rare
- Abortion, Preterm labor, Still birth - all reported, but more d/t severity of maternal infection.
- Naso Pharyngeal Swabs
  - Reverse trasnsriptase PCR → Most sensitive & specific test
  - Rapid Influenza Diagnostic Test (RIDT) → Least sensitive & least indicative
- Treatment
  - Neuraminidase Inhibitors
    - Oral Oseltamivir for prophylaxis
    - Zanamivir inhalation for treatment

Measles & Mumps → Not Teratogenic

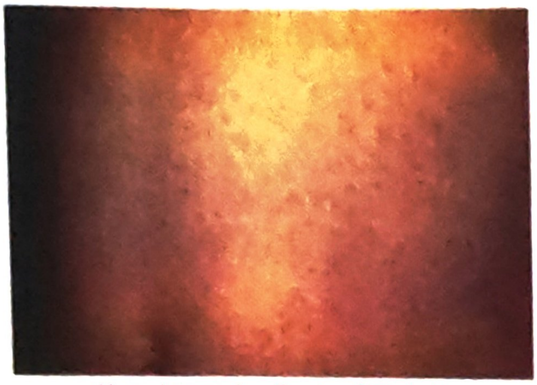
## Rubella/ German Measles 00:16:52

- RNA Togavirus

### MATERNAL INFECTION

- Mild febrile illness

- Generalized maculo - papular rash on face & trunk
- 25-50% are asymptomatic



Maculopapular Rash of Rubella

## DIAGNOSIS

ELISA → IgM antibody detected within 4-5 days of onset of infection

→ IgG peaks 1-2 weeks after rash

→ High avidity IgG antibodies indicates infection was at least 2 months prior to tests done.

→ Most complete Teratogen

→ Worse during Organogenesis (1-12 wks of pregnancy)

→ Rash in

1st trimester MTCT → 90%

2nd trimester MTCT → 50%

End of 2nd trimester MTCT → 25%

*MTCT = Mother to child transmission

*High Avidity IgG Antibodies

- Avidity is the strength of bond of Antibody with Host Cell. i.e. how much strong is the bond
  - ○ Loose bond = Low Avidity = Recent infection
  - ○ Strong bond = High Avidity = Remote infection

- Done to differentiate Recent positive IgG from Remote positive IgG
- If IgG is positive for long time (Remote positive IgG)

↓

Mother is immune to Rubella & problems in fetus are not likely to happen

- Recent positive IgG (Both IgG & IgM positive)

↓

Baby may be affected

## CONGENITAL RUBELLA SYNDROME

### FEATURES

- Cardiac septal defects
- Pulmonary stenosis
- Microcephaly
- Cataract
- Hepatosplenomegaly
- Sensorineural deafness
- Intellectual disability
- Neonatal purpura
- Radiolucent bone disease
- Neonates with congenital rubella may shed the virus for many months (threat to others)
- Delayed Morbidities a/w Congenital Rubella Syndrome (CRS)
  - Progressive Pan Encephalitis
  - IDDM
  - Thyroid disorders
- Prevention
  - Droplet precaution for 7 days after rash
  - Can try Passive immunization within 5 days of exposure
  - MMR vaccine to all non pregnant women
  - Avoid vaccine within 1 month of planning the pregnancy or during pregnancy (as it contains live attenuated virus which can cause defects in fetus)

00:25:33

## VACCINES IN PREGNANCY

| CONTRAINDICATED | SAFE |
|---|---|
| Measles | Tetanus & Diphtheria toxoids (Tds) |
| Mumps | Hepatitis B |
| Rubella | Influenza |
| Varicella | Meningococcal |
| BCG | Rabies |

*Anthrax, Hepatitis A, Japanese Encephalitis, Polio IPV, Yellow Fever vaccines are given on special recommendation

## ZIKA VIRUS

00:26:31

- 1st mosquito borne teratogen
- Daytime Aedes mosquito bites
- Family = Flaviviridae
- May have sexual transmission

### MATERNAL INFECTION

- Rash, Fever, Headache, Arthralgia, Conjunctivitis
- Neurological complications
  - Guillian - Barre syndrome, Neuropathy & Myelitis

### FETAL INFECTION (Fetus can be severely affected)

- Birth defects (5-15%)
- Neonatal Deaths (5-7%)

### CONGENITAL ZIKA SYNDROME

- Microcephaly
- Lissenocephaly
- Ventriculomegaly
- Intra cranial calcifications
- Ocular abnormalities
- Congenital contractures

### DIAGNOSIS IN PREGNANT WOMEN

ZIKA virus in blood & urine

- Do Serological testing & confirm by PCR

*No specific treatment or vaccine of ZIKA so far

## PROTOZOAL INFECTIONS

### TOXOPLASMOSIS

00:28:53

- Feline stage in cats
- Non feline stage in Humans
- Infection is with cat faeces or infected meat ingestion

## MTCT OF TOXOPLASMOSIS

- Rises with increasing gestational age

  1st trimester → 15%

  2nd trimester → 44%

  3rd trimester → 70%

## CLINICALLY AFFECTED FETUSES HAVE

- Low birth weight
- Hepatosplenomegaly, Jaundice, Anemia
- Neurological diseases with Intracranial calcification, Hydrocephalus, Microcephaly often accompanied by convulsions
- Classical Triad
  - Chorioretinitis
  - Intracranial calcifications
  - Hydrocephalus

## DIAGNOSIS

- IgG before pregnancy → No risk
- IgM → appear by 10 days of infection
- Best results are obtained with the Toxoplasma serological profile
- Toxoplasma IgG avidity increases with time
- If high - avidity IgG result is found, infection in the preceding 3-5 months is excluded

## TREATMENT

- Goal of Rx is reduction in rates of serious Neurological sequelae & Neonatal demise
  - Spiramycin alone (does not cross placenta)
  - Pyrimethamine - Sulfonamide with Folinic Acid (If Fetal Infection is suspected)

## PREVENTION

1. Cooking meat to safe temperatures
2. Peeling or thoroughly washing fruits & vegetables
3. Cleaning all food preparation surfaces
4. Wearing gloves when changing cat litter

5. Avoiding feeding cats raw or undercooked meat & keeping cats indoor

## MALARIA IN PREGNANCY

00:34:00

- Pregnant women have increased susceptibility
- VAR2CSA antigen leads to Antibody formation, which causes accumulation of infected erythrocytes in the placenta, leading to Pregnancy specific Antimalarial immunity
- Higher rates of Maternal Morbidity & Mortality

### FETAL INFECTION

- Abortions
- Still birth
- Pre-term birth
- Low birth weight
- Congenital malaria (< 5% incidence)

### DIAGNOSIS

- Thin & Thick films (Best method)
- Malaria -specific antigens are used for Rapid diagnostic testing but their sensitivity in pregnancy is still an issue
  - * Anemia is usually seen in pregnant women with Malaria d/t significant amount of Hemolysis

### TREATMENT

1. Uncomplicated malaria by P. vivax, P. malariae, P. ovale, Chloroquine sensitive Falciparum malaria
   - Chloroquine or Hydrocychloroquine
2. Complicated P falciparum malaria - Artemisinin based regimens
3. Chloroquine resistant P. Vivax - Mefloquine

## HIV IN PREGNANCY

00:38:00

- Mostly by HIV – 1 infection
- Transmitted by
  1. Sexual intercourse
  2. Blood transfusion/ Infected needles
  3. During labor & delivery

4. Breast milk

- Primary determinant of transmission → Plasma HIV - 1 viral load
- $CD_4$ site serves as a receptor for virus
- Once infected, $CD_4$ lymphocytes may die

- Illness with AIDS is d/t profound immunodeficiency that gives rise to various opportunistic infections and neoplasms

According to CDC, 'AIDS' is

- $CD_4$ T cell count < 200 cells/μl
- $CD_4$ T cell count comprising < 14% of all lymphocytes or
- One of several AIDS - defining illness

## SCREENING

- HIV screening using an OPT-OUT approach
- Repeat testing during 3rd trimester is considered for all pregnant women
- Antigen / Antibody combination immuno-assay (Screening Test)
  - Detects antibodies against HIV-1 & HIV-2 & HIV-1 $_p$24 Ag.
  - If screening test is positive

↓

Do HIV-1 NAAT for confirmation

## VERTICAL TRANSMISSION (MTCT Rate → 25-40% overall)

- 1% with < 400 copies/ml
- No cases of vertical transmission with maternal viral load <50 copies/ml at delivery

## TIMING OF TRANSMISSION

- 20% of vertical transmission occurs before 36 weeks
- 50% in the days just before delivery (i.e. 38-39 wks)
- 30% Intra-partum
- Breast feeding MTCT may be as high as 30-40%

## CAUTION

- Didanosine, Stavudine & full dose of Ritonavir are avoided in pregnancy as they are Toxic to mother (not Teratogenic)
- Antiretro viral naive patients are given ART regardless of

trimester

- In general, the starting regimen comprises
  - 2 Nucleoside Reverse transcriptase inhibitors

    +

  - Either a Ritonavir boosted protease inhibitor or an Integrase inhibitor

* Full dose of Ritonavir is C/I in pregnancy due to its toxicity but Ritonavir boosted protease inhibitors can be given

RECOMMENDATIONS

- Taking ART & pregnant
  - Continue current drugs
  - All women get ART ASAP
  - Monitor $CD_4$ count at initial and then 3 monthly visits
- Art Naive
  - 2 NRTI
    - ○ Abacavir / Lamivudine
    - ○ Tenofovir Disoproxil Fumarate / Emtricitabine
  - And a Protease Inhibitor
    - ○ Atazanavir / Ritonavir
  - Or an Integrase Inhibitor
    - ○ Raltegravir

*Oral ART during pregnancy + IV Zidovudine during labor can reduce MTCT to < 2 %

INTRAPARTUM CARE

- As per NACO & WHO guidelines, there is no benefit of Cesarean section over NVD (Normal Vaginal Delivery)
  - C-section is done only in Obstetric indications in an HIV pregnancy
- HIV RNA > 1000 copies / ml → C-section at 38 weeks
- HIV RNA < 1000 copies / ml → Vaginal delivery can be done
- For HIV RNA > 1000 copies / ml, we can reduce MTCT by giving 2

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mg / kg ZDV IV as loading dose then 1 mg/kg hourly till delivery

- For C-section, start IV dose 3 hours prior

## ANTIRETROVIRAL THERAPY

- Ideal strategy to suppress viral load & minimize Vertical transmission includes
  1. Preconceptional ART
  2. Ante-partum ART
  3. Intra-partum continuation of Ante-partum Oral ART regimen + IV Zidovudine
  4. New born ART prophylaxis

## PPH IN HIV WOMEN

- Best managed with Oxytocin and Prostaglandin analogues
- Methyl ergonovine (Methergine) and other ergot alkaloids adversly interact with Reverse transcriptase inhibitors and Protease inhibitors to cause severe vasoconstriction.

## Chapter 13

# DRUGS IN PREGNANCY

## FDA CATEGORIES - 5 CATEGORIES 00:00:40

### CATEGORY A

- Safe in pregnancy
- Thyroxine
- Multi Vitamins
- Folic Acid

### CATEGORY B

- have adverse effects in animals
- all studies in human are safe
- Penicillin
- Cephalosporins
- Didanosine
- Metronidazole
- Nitrofurantoin

### CATEGORY C

- Teratogenic in animals
- Inadequate human studies
- most commonly used drugs in Obstetrics
- Mebendazole
- Albendazole
- Acyclovir
- Chloroquine
- Lamotrigine (Category C Anti-Epileptic drug; DOC for Epilepsy in pregnancy)

For more notes visit

Or click this page to visit the channel

### CATEGORY D 00:04:02

- known human teratogens
- to be given only when benefits > Risk
- Antiepileptics (Phenytoin, Carbamazepine)
- Quinine

### CATEGORY X 00:06:13

- Known Teratogens
- Totally contraindicated (Risk > Benefits)
- Alcohol
- Androgens
- Vitamin A
- Lithium
- Warfarin (in early pregnancy)
- Radio Iodine
- Cancer Chemotherapeutic Drugs
- Tetracyclins

## ALCOHOL IN PREGNANCY

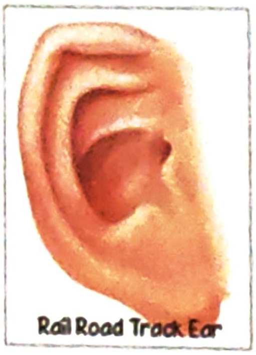
### FETAL ALCOHOL SYNDROME 00:08:10

- All are required
  1. Dysmorphic Facial features (all 3 required)
     - Small palpebral fissures
     - Thin vermilion border
     - Smooth Philtrum
  2. Prenatal and / or postnatal growth impairment
  3. CNS abnormalities (1 required)
     - Structural: Head size < 10th percentile, significant brain abnormality on imaging
     - Global cognitive or intellectual deficits

## ALCOHOL RELATED BIRTH DEFECTS

00:09:35

1. Cardiac → ASD or VSD
2. Skeletal → Radio ulnar synostosis, joint contractures
3. Renal → Aplastic or hypoplastic kidneys
4. Eyes → Strabismus, Ptosis, Optic nerve hypoplasia
5. Ears → Conductive or Neuro-sensory hearing loss
6. Minor → Hypoplastic nails, Clinodactyly, Pectus carinatum or excavatum, Camptodactyly, Hockey stick Palmar crease, Rail Road Track Ears



Rail Road Track Ear

## WARFARIN EMBRYOPATHY

00:11:10

- Warfarin is a Vitamin K Antagonist & a potent anticoagulant
- Low molecular weight → Readily cross placenta
- Causes Embryotoxic & Fetotoxic effects
- 6-9 weeks exposure → WARFARIN EMBRYOPATHY
- Features
  1. Stippling of vertebrae & femoral epiphysis
  2. Nasal hypoplasia
  3. Depression of Nasal bridge

## LEFLUNOMIDE

00:12:21

- A Pyrimidine synthesis inhibitor
- Used for Rx of Rheumatoid arthritis
- C/I in pregnancy because it is a/w multiple abnormalities like
  - Hydrocephalus
  - Eye abnormalities
  - Skeletal abnormalities

    - Embryo death
- Detectable in plasma for upto 2 years following it's discontinuation
- Cholestyramine Treatment / Washout
    - Cholestyramine binds with Leflunomide & helps in early excretion of drug
    - Cholestyramine Rx is F/b verification of serum levels of Leflunomide (Serium levels of Leflunomide should be undetectable on 2 tests performed 14 days apart)

## FETAL HYDANTOIN SYNDROME

00:13:58

- d/t intake of Antiepileptics like Phenytoin, Carbamazepine
- Facial features include
    1. Upturned nose
    2. Mild mid facial hypoplasia
    3. Long upper lip with thin Vermilion border
    4. Distal digital hypoplasia

* Atleast 3 months washout period is required before planning Pregnancy

## Chapter 14

# ANEMIA IN PREGNANCY

MC cause of Anemia in pregnancy in India → Nutritional Anemia

### CAUSES OF ANEMIA

1. Production
   - a. Iron Deficiency Anemia
   - b. Megaloblastic Anemia
   - c. Folic Acid Deficiency Anemia

2. Lysis
   - a. Hemolytic Anemia
   - b. Chronic Blood Loss

### DEFINITIONS

- WHO → Hb → < 11 gm%
- CDC → Hb → < 11 gm% or
  Hb → < 10.5 gm% in 3rd trimester
- Mild → Hb → > 10 gm% to < 11 gm%
- Moderate → Hb → 7-10 gm%
- Severe → Hb → < 4 - 7gm %
- Very severe → Hb → < 4gm %

### IRON DEFICIENCY ANEMIA

00:03:47

### IRON REQUIREMENT IN PREGNANCY

- 1000 mg elemental Iron [4-6 mg/ day x 280 = 1120 mg]

  500 mg → for Hb expansion
  300 mg → for fetus, placenta
  200 mg → wasted

## MANAGEMENT

- 100 mg / day elemental Iron Tab in Ⓝ pregnancy
- 200 mg / day elemental Iron in mild to moderate anemia
- Oral Iron supplementation forms
  - Fe Sulphate

    Fe Ascorbate    Better Absorbable forms

    Carbonyl Iron

**Deworm the patient with MEBENDAZONE (100 mg Tab BD x 3 Days)**

- Injectable Preparations
  - Only indication → Intolerance or Malabsorption
  - Stop oral Iron at the time of giving injectables
  - Injectable Forms

    1) Fe Dextran (IM/IV)

    2)Fe Sorbitol [IM]

    3)Fe Sucrose (IV) - No anaphylaxis (no test dose is given)
- Rate of rise of Hb with Oral & Injectable preparation is same [1 gm% Hb rise over 2 ½ - 3 wks]

**Requirement of Iron**

- 2.21 x wt in kg x (Targeted Hb – Pt Hb) + 1000 mg (for stores)
- ≅ 200 mg / gm% Hb deficiency

- Requirement of Blood for Rx of Anemia in pregnancy
  - Indications
- Hb → <7 gm% or patient is severly anemic later in pregnancy
  - Whole blood ↑ Hb by 0.8 - 0.9 gm%
  - Packed cells ↑ Hb by 0.8 - 0.9 gm % [lesser volume load] [so better]

- IDA Indices

1. Serum Ferritin
   - 1st parameter to change
   - Ⓝ → 40-160 ng/ml
   - IDA → < 20 ng/ml

2. Hb
   → ↓
3. MCV
   → ↓
4. MCH
   → ↓
5. Serum Total Iron → < 50 μg/dl
6. Total Iron binding capacity → > 400 μg/dl
7. Red cell distribution width (RDW) → ↑

- Thalassemia Indices
  1. RDW → Normal
  2. MCH → < 27 pg [Normal → 29 pg]
  3. Hb → Normal or slightly low
  4. MCV/RBC → < 13 [Mentzer Index)
  5. On HPLC → HbA levels > 3.5 HbA2

*Peripheral smear of both IDA & Thalassemia shows Microcytic Hypochromic Anemia

## MEGALOBLASTIC ANEMIA

00:23:00

### CAUSES

1. Folic Acid deficiency
   - ↑ demand
   - ↓ Supply
   - Malabsorption
   - Intestinal Sx or resection

2. Vit $B_{12}$ Deficiency
   - ↓ Absorption
   - ↓ Intrinsic factor
   - Achlorhydria

### FEATURES

- Slow onset

- Hb ↓
- MCV → › 100 fL
- Requirement → 0.4 to 0.5 mg/day
- Supplementation of Folic acid → 5 mg / day in Megaloblastic anemia
- Vitamin $B_{12}$ (Cobalamin) requirement is only met by non veg diet so Inj. cynacobalamin can be given in vegetarian females

### Nutritional Anemia

- IDA + Megaloblastic Anemia

### Dimorphic Anemia

- Microcytic Hypochromic RBCs + Megaloblasts

# Chapter 15

## VOMITING IN PREGNANCY

- aka Morning Sickness 00:01:05
- can happen anytime

### REASON OF EXCESSIVE VOMITING

- ↑ HCG
- ↑ Estrogen
- ↑ Progesterone
- ↑ Leptins
- ↑ Ghrelin
- Placental growth hormone

### HYPEREMESIS GRAVIDARUM 00:02:25

- Severe vomiting
- Unrelenting nausea
- Almost no intake of food and fluids
- Environmental and Psychological factors also associated

### SYMPTOMS

- Dehydration
- Weight loss
- ↓ HCl [Alkalosis]
- Hypokalemia
- Starvation ketosis
- Mild liver dysfunction [in severe cases]

### DISORDERS TO BE RULED OUT

1. Gastroenteritis
2. Hepatitis
3. Pancreatitis
4. Acute cholecystitis
5. Pyelonephritis
6. Peptic Ulcer Disease

### LATE PREGNANCY VOMITING TO BE RULED OUT

1. Pre Eclamptic Toxemia
2. Fatty Liver

## PROBLEMS IN MOTHER DUE TO EXCESSIVE VOMITING 00:08:10

1. Esophageal tear - Boerhaave Syndrome
2. Mallory Weiss Tears
3. Diaphragmatic Tears
4. Acute Kidney Injury
5. Depression
6. Vitamin K Deficiency [Hypoprothrombinemia]
7. Vitamin $B_1$ [Thiamine] Deficiency [Wernicke Encephalopathy]
   - Triad of
     1. Opthalmoplegia
     2. Confusion
     3. Ataxia

## OBSTETRIC OUTCOME

- Pre-term labour
- Abruption
- Pre Eclamptic toxemia

## TREATMENT 00:11:21

1. MILD VOMITING
   - A. Diet Modification
     - Frequent small feeds
     - Dry biscuits in the morning (empty stomach)
     - Stop short of satiety
   - B. Medication → Tablet Doxylamine + $B_6$ (Pyridoxine)
2. MODERATE VOMITING
   - A. Medication
     - Prochlorperazine
     - Promethazine
     - Metoclopramide
       } Oral
     - Ondansetron → Rectal / Oral
3. SEVERE VOMITING
   - A. IV Hydration
     - Normal saline

  - Ringer lactate
  - ??Dextrose (Serum/Urine Ketones to be monitored)]

B. Anti-emetics

  - IV Promethazine (Phenergan)
  - IV Prochlorperazine
  - IV Ondansetron
  - IV Metoclopramide

C. Add 100 mg Thiamine

4. INTRACTABLE VOMITING

   A. Parentral Nutrition

   B. Enteral Nutrition

* From the onset of pregnancy until 16 weeks the vomiting continues, after that it will subside.

## Chapter 16

# ECTOPIC PREGNANCY

### LOCATION 00:00:39

1. FALLOPIAN TUBE (MC)
    - Ampulla (MC site - 70%)
    - Isthmus
    - Fimbrial area
    - Cornual / Interstitial / Intra-mural
2. Ovary
3. Abdomen

### PRIMARY OVARIAN ECTOPIC

- Spiegelberg's Criteria
- No evidence of attachment
- Ovarian tissues seen in the periphery of ectopic
- Tube on same side should be intact

### PRIMARY ABDOMINAL ECTOPIC

- Studdiford Criteria
- No evidence of any attachment to the tube or Uterus
- Primary abdominal nidation of Ectopic should be present i.e. there should be evidence of placenta attached in Abdomen

* Primary Ovarian & Abdominal ectopic are much rarer as compared to secondary Ovarian & Abdominal ectopic

*Secondary Ovarian Ectopic → Pregnancy coming out from Uterus & settling on Ovary

*Secondary Abdominal Ectopic → Pregnancy coming out from tube & settling in Abdomen

- Term abdominal pregnancy is very rare-Delivered by Laparotomy

4. Cesarean Scar Ectopic
5. Cervical Ectopic

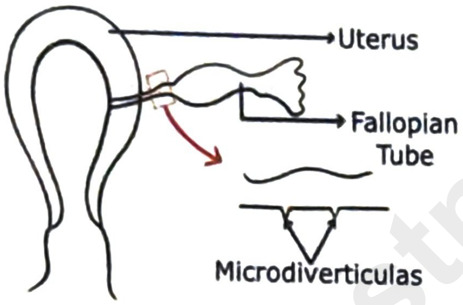
## TIME OF RUPTURE

- Isthmic Ectopic → 4-6 wks
- Ampullary Ectopic → 6-8 wks
- Interstitial / Cornual Ectopic → 12-16 wks

## CAUSES

00:08:34

1. Pelvic Inflammatory Diseases- Salpingitis Isthmica Nodosa
   - MC Cause
   - Microdiverticulas are present



2. Tubal Surgeries
   - Recanalization/ Re-anastomosis Sx
   - Previous Tuboplasty
   - Fimbriostomy
3. Kinked Fallopian Tubes
4. Abdominal / Pelvic Surgeries
5. Endometriosis
6. Tuberculosis
7. Previous Ectopic
   - 15% chance, if previous pregnancy is ectopic
8. Infertility Treatment
9. Use of IUCD
10. Use of POP

If a normal woman conceives
- 98-99% are Uterine pregnancies
- 1-2% are Ectopic pregnancies

If a women under contraception (IUCD/POP) conceives 00:17:11

- Actual possibility of conception ↓ses
  - No. of pregnancies ↓ ↓
  - No. of Ectopic pregnancies ↓ ↓
- But in those pregnancies
  - 95% are Uterine pregnancies
  - 5% are Ectopic pregnancies

MANAGEMENT OF INTRA UTERINE PREGNANCY WITH IUCD INSITU

- Remove the IUCD first
  - If can't locate
    - USG, X-ray pelvis, hysteroscopy can be done to localize IUCD
    - Laparoscopy may be required to locate IUCD
- If woman,
  - Wants the child → continue the pregnancy (Risk of Abortion is 25% even after removal of IUCD)
  - Don't want baby → MTP

*Pregnancy with IUCD → Risk of abortion is > 50%

PRESENTATION

SYMPTOMS 00:19:41

- Pain abdomen (MC)
- Amenorrhea
- Bleeding d/t shedding of Decidua
  - Fate of Ectopic (Fallopian Tube)
    - Vascular insufficiency (MC)
    - Tubal abortion
    - Rupture of tube (Rare)

Vascular insufficiency

↓

Death of Fetus

↓

⊗ HCG production

↓

⊗ Progesterone by Corpus luteum

↓

Shedding of Decidua

↓

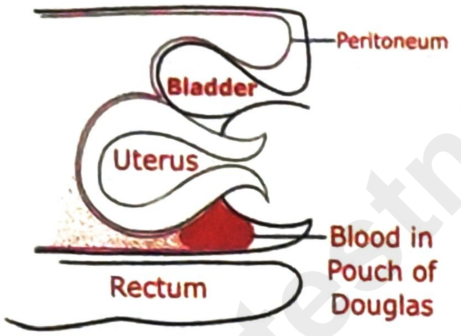
Bleeding from Vagina

- Syncopal attacks

SIGNS 00:24:10

- Shock
- Lower abdominal tenderness
- Cullen Sign → Brusing around the Umbilicus }

  Turner Sign → Brusing at Flanks } Evidence of Hemoperitoneum
- On P/v Examination
  - → Cervical motion tenderness
  - → Bogginess/fullness in Pouch of Douglas
- Aspiration of POD shows → Non clotting blood d/t Peritoneal Fibrinolysins



MANAGEMENT 00:30:55

RUPTURED ECTOPIC

1. RESUSCITATION
   - 2 IV line of 14 Gauge
   - Colloids, IV Fluids
   - Arrange for Blood (Think of O -ve)
   - Plan the Sx
2. SURGICAL MANAGEMENT 00:32:21

- Can be done by
  - Laparotomy
  - Laparascopy (not done in shock)
- Total Salpingectomy

UNRUPTURED ECTOPIC → SAVE THE TUBE 00:40:22

1. MEDICAL MANAGEMENT 00:42:47

- Methotrexate (local/systemic)

- Actinomycin
- KCL (Cardiotoxic to Fetal Heart)
- Mifepristone

2. SURGICAL MANAGEMENT

- Linear Salpingostomy (SxOC)
  - Incision is given on bulge of tube & take out ectopic & leave the tube open i.e. no sutures applied
- Linear Salpingotomy
  - Incision is given on bulge of tube & take out ectopic
  - Sutures are applied to close tube
  - Outdated procedure
- Resection Anastomosis
- Milking of Tube [ ↑ ses Risk of Ectopic Pregnancy - Outdated)

CRITERIA FOR MEDICAL MANAGEMENT

| Medical Mx | Factor | Surgical Mx |
|---|---|---|
| < 3.5 cm | Size of Ectopic | > 3.5 cm [4cm] |
| < 5000 IU | HCG | > 5000 IU |
| Absent | Cardiac Activity | Present |
| Absent | signs of rupture | Present |

DIAGNOSIS OF PREGNANCY 00:54:51

CASE 1

- LMP 16th August & missed period on 16th September; tests done for Dx of Pregnancy ?
  - Urine Pregnancy Test → ⊕ in 60-70%
  - β HCG → ⊕ in > 95%
  - Radio Immune Assay → ⊕ in 100%

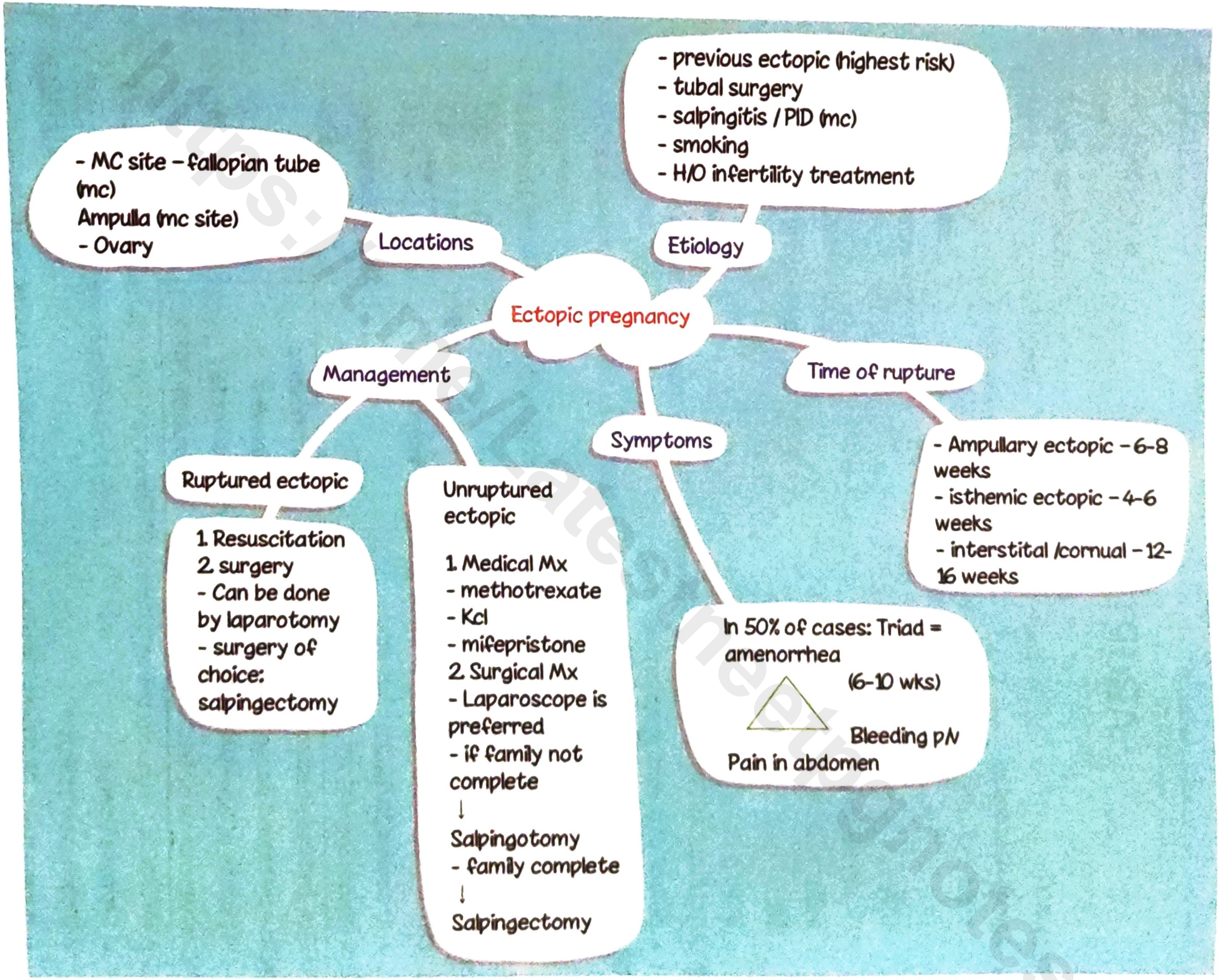
CASE 2

- LMP - 16th August & missed period on 16th September; Period of Gestation on 16th September?
  - Period of Gestation is calculated from 1st Day of LMP
  - POG = 4 weeks & 3 days

Dx of pregnancy on 4 weeks 3 Days POG by

| Type of Scan | Gestational Sac | Cardiac Activity |
|---|---|---|
| TVS (Tans Vaginal Sonography] (Preferred) | → 4+ weeks | → 5 + weeks |
| TAS (Trans abdominal Sonography) | → 5 + weeks | → 6 + weeks |

- MRI → Trouble solver
- Laparoscopy (Best)
- HCG
  - Doubling in 48 Hrs. → Intrauterine Pregnancy
  - Doubling in 5-7 days → Ectopic Pregnancy
- DISCRIMINATORY ZONE 01:06:45
  - HCG level beyond which we must see a sac
  - TVS → >1500 IU
  - TAS → >6500 IU
- SERUM PROGESTERONE
  - >25 ng/ml → Ⓝ Intra uterine Pregnancy
  - <5 ng/ml abortion → Ectopic Pregnancy or Missed abortion



**Ectopic pregnancy**

**Locations**

- MC site – fallopian tube (mc)
Ampulla (mc site)
- Ovary

**Etiology**

- previous ectopic (highest risk)
- tubal surgery
- salpingitis / PID (mc)
- smoking
- H/O infertility treatment

**Time of rupture**

- Ampullary ectopic – 6-8 weeks
- isthemic ectopic – 4-6 weeks
- interstital /cornual – 12-16 weeks

**Symptoms**

In 50% of cases: Triad = amenorrhea (6-10 wks)
△
Bleeding p/V
Pain in abdomen

**Management**

**Ruptured ectopic**

1. Resuscitation
2. surgery
- Can be done by laparotomy
- surgery of choice: salpingectomy

**Unruptured ectopic**

1. Medical Mx
- methotrexate
- Kcl
- mifepristone
2. Surgical Mx
- Laparoscope is preferred
- if family not complete
↓
Salpingotomy
- family complete
↓
Salpingectomy

# Chapter 17

# ABORTION

## ABORTION 00:00:56

- Age of Abortus in
  - India → < 28 weeks
  - UK → < 24 weeks
  - USA → < 20 weeks
- MTP can be done upto
  - India → 20 weeks
  - UK → till 24 weeks
  - USA → till 20 weeks

## SPONTATEOUS ABORTIONS 00:03:24

- 50% of all human pregnancies

Types

- Embryonic (50%)
- Anembryonic [aka Blighted ovum (50%)]

## EMBRYONIC ABORTIONS

### CAUSES 00:05:00

1. CHROMOSOMAL → Usually present during 1st trimester
   - Trisomies 16/18/21
   - Monosomy 45 XO

MCC of Embryonic abortions → Chromosomal

MC chromosomal cause of abortion → Trisomies

- MC cause of abortion in Trisomies → Trisomy 16

MC chromosomal defect in pregnancies → Monosomy 45 XO

2. ANATOMICAL → Usually present during 2nd Trimester
   - Septate Uterus
   - Bicornuate Uterus
   - Incompetent OS (Short Cervix)

3. MATERNAL → Can present during any of the trimster
   - Syphilis
   - SLE
   - APLA Syndrome
   - DM
   - TORCH infections
   - TB
   - Cancers
   - Celiac Disease
   - Hypothyroidism

## RECURRENT PREGNANCY LOSS

00:09:19

- Loss of ≥ 3 pregnancies

CAUSES

- Chromosomal (MC)
  - If Cardiac activity is present on USG → chance of RPL is 4.5%
  - If Cardiac activity is absent on USG → chance of RPL is 13-20%
- Anatomical
- Maternal [Torch infection does not cause RPL]
  - DM
  - SLE
  - APLA
  - Hypothyroidism
  - Celiac disease

## ANATOMICAL CAUSES

00:12:47

1. SEPTATE UTERUS
   - MC Mullerian defect
   - Causes 2nd trimester abortion
   - Mx → Hysteroscopic resection
2. BICORNUATE UTERUS
   - Strassman's Metroplasty
     - Unification Sx

    - Only indicated in Recurrent Pregnancy Loss

3. Incompetent OS (Short Cervix [<2.5 cm])
    - Short Cervix efface early & predisposes to both Preterm Labor & Abortion
    - Mx by Encerclage
        - Applied > 12 weeks, removed ≥ 37 weeks
        - MC → MC Donald's cerclage

## THROMBOPHILIAS 00:16:15

Tendency to form a Thrombus is Thrombophilia

### 1. INHERITED THROMBOPHILIAS

- Factor V leiden mutation
- Methyl Tetra Hydro folate Reductase Gene Mutation
- Prothrombin Gene Mutation
- Protein C, S deficiency
- Antithrombin III deficiency

### 2. ACQUIRED THROMBOPHILIAS

### ANTI PHOSPHOLIPID ANTIBODY SYNDROME

- APL Anti-bodies
    - Lupus Anticoagulants
    - Anti cardiolipin Antibodies
    - Anti β2 Glycoprotein Antibodies
- Hyper Homocystenemia
- Criteria for APLA
    - Clinical criteria
        - ○ ≥ 1 Venous / Arterial Thrombosis
        - ○ ≥ 1 Morphologically normal baby lost after 10 wks
        - ○ ≥ 1 premature birth before 34 wks because eclampsia, severe preeclampsia or placental insufficiency.
        - ○ ≥ 3 Abortions before 10 weeks
    - Lab criteria

Direct visualization of:

- ○ Anticardiolipin Antibodies (IgG & IgM) ⊕
- ○ Lupus anti coagulant ⊕
- ○ Anti β2 glycoprotein antibody

- Management
  - LMW Heparin
  - Anti Platelet Drugs

## TORCH INFECTIONS

### CYTOMEGALO VIRUS

- MC mother to child transmitted infection → CMV
- If CMV transmitted before 15 weeks → 5-6% babies are affected
  - Features
    - Microcephaly
    - Intra Ventricular Hemorrhage
    - Mental Retardation
    - Peri-ventricular calcification
- CMV is assessed by→Avidity Test (Best)
  → Viral culture of Amniotic fluid

### RUBELLA

- MTCT in 1st trimester → Up to 80-85%
  MTCT in 2nd trimester → up to 60-65%
  MTCT at end of 2nd trimester → up to 25%
- If Rubella vaccine is given → Pregnancy should be avoided for atleast 1 month after vaccine administration

### TOXOPLASMA

- MTCT in 1st trimster → up to 10% [ ↑ ↑ Anomalies]
  MTCT in 3rd trimester → up to 60%
  [Congenital Toxoplasmosis Syndrome]
- Congenital Toxoplasmosis Syndrome
  - Features
    - Intracerebral calcification
    - Chrioretinitis
    - Microcephaly
  - Rx
    - Spiramycin 1gm, 2-3 times/ day
    - 3 wks on, 1 wk off (If we have to give Spiramycin for long duration)

## CHICKEN POX

- Congenital Varicella Syndrome
  - Max chance of transmission → 13-20 weeks
  - Features
    - Microcephaly
    - Cerebral calcification
    - IUGR
    - Limb Hypoplasia
    - Cortical atrophy
  - If transmitted around delivery time
    - within 5 days before delivery or } up to 30%
    - within 2 days after delivery } Neonatal mortality
    - Rx with Varicella zoster immunoglobulin (VZIG)
  - Diagnosed by
    - Tzank Smear
    - Direct flouroscent antibody
    - Nucleic Acid Amplification test (NAAT)

## HIV

- MTCT Rate → 25-30%
  - If breast feeding → 10-15% more chance
  - Breast feeding contraindicated except in developing countries [NEVIRAPIN SYRUP RECOMMENDED]
- Management during pregnancy
  - Zudovudine or Tenofovir
  - Lamivudine (3 TC)
  - Nevirapine or Effavirenz
- Method of Delivery
  - Normal vaginal delivery
  - Cesarean section only in Obstetric indications or if viral load more than 1000 copies/ mL

## HEPATITIS B

- MTCT Rate
  - Antigen ⊕ → 90%
  - Antibody ⊕ → 10%

- Chronic Carrier State → 40%

At birth, both Active & Passive Immunization should be given to Neonate

## PRESENTATION OF ABORTION 00:36:41

- Pain abdomen
- Bleeding P/V
- PV Examination
  - OS closed, Uterine size = POG → Threatened Abortion
  - OS open, products are bulging → Inevitable abortion
  - OS open, Products are felt with H/O passage of some mass → Incomplete Abortion
  - OS closed, H/O passage, normal Uterine size → Complete Abortion
- On USG,
  - Cardiac activity ⊕ at 9 weeks
  - Crumpled sac with some fleshy mass inside
  - No pain & no bleeding

  } 12 weeks → Missed abortion
- Blighted Ovum / Anembryonic Gestation
  - Normally around 7 weeks of gestation, yolk sac is pinched out
  - Pregnancy not gone beyond the stage of sac → Blighted Ovum

*HIV & Hep-B does not cause Abortion

## MEDICAL TERMINATION OF PREGNANCY [MTP] 00:43:31

- MTP can be done only < 20 weeks in India by
  - Gynecologist
  - Doctor who trained for 6 months in gynecology
  - Doctor who performed at least 25 MTPs under supervision
- In 1st Trimester, Done by

### MEDICAL ABORTION

- 99% successful → If done with in 1st 7 wks of pregnancy
- 95% successful → If done within 1st 9 wks of pregnancy

- Drugs
  Tab Mifepristone Orally
    - Antiprogestin
    - Kills the fetus
    - 200 - 600 mg

  ↓24-72 hrs later

  Tab Misoprostol (PGE1) Vaginally
    - 800 µg
    - Expels the fetus

Flow chart to follow while doing MTP

Do USG → to confirm the location of Fetus

↓

If Intrauterine Pregnancy → Administer Drugs (after counseling the woman)

↓

Wait for Bleeding to get over

↓

Do a check Sonography → to check completion

## SURGICAL ABORTION

- Manual Evacuation Syringe
  - Can be done up to 45 days of last periods
- Suction Evacuation
  - Can be done up to 8-10 wks of last periods
- Dilatation & Curretage
  - Can be done up to 8-12 wks of last periods

## PROSTAGLANDINS

- › 12 weeks, procedure of Choice → Prostaglandins
  - Misoprostal [PGE 1]
    - Orally, Rectally or Vaginally
  - Dinoprostone [PGE 2]
    - Gel Form
    - Vaginally

- ○ Induces Uterine contractions & causes expulsion of fetus
- Carboprost [$PGF_{2}\alpha$]
  - ○ IM only

- Intra Amniotic Pgs
  Extra Amniotic Ethacridine Lactate
  Extra Amniotic Hypertonic Saline
  Extra Amniotic Hyper Osmolar Urea

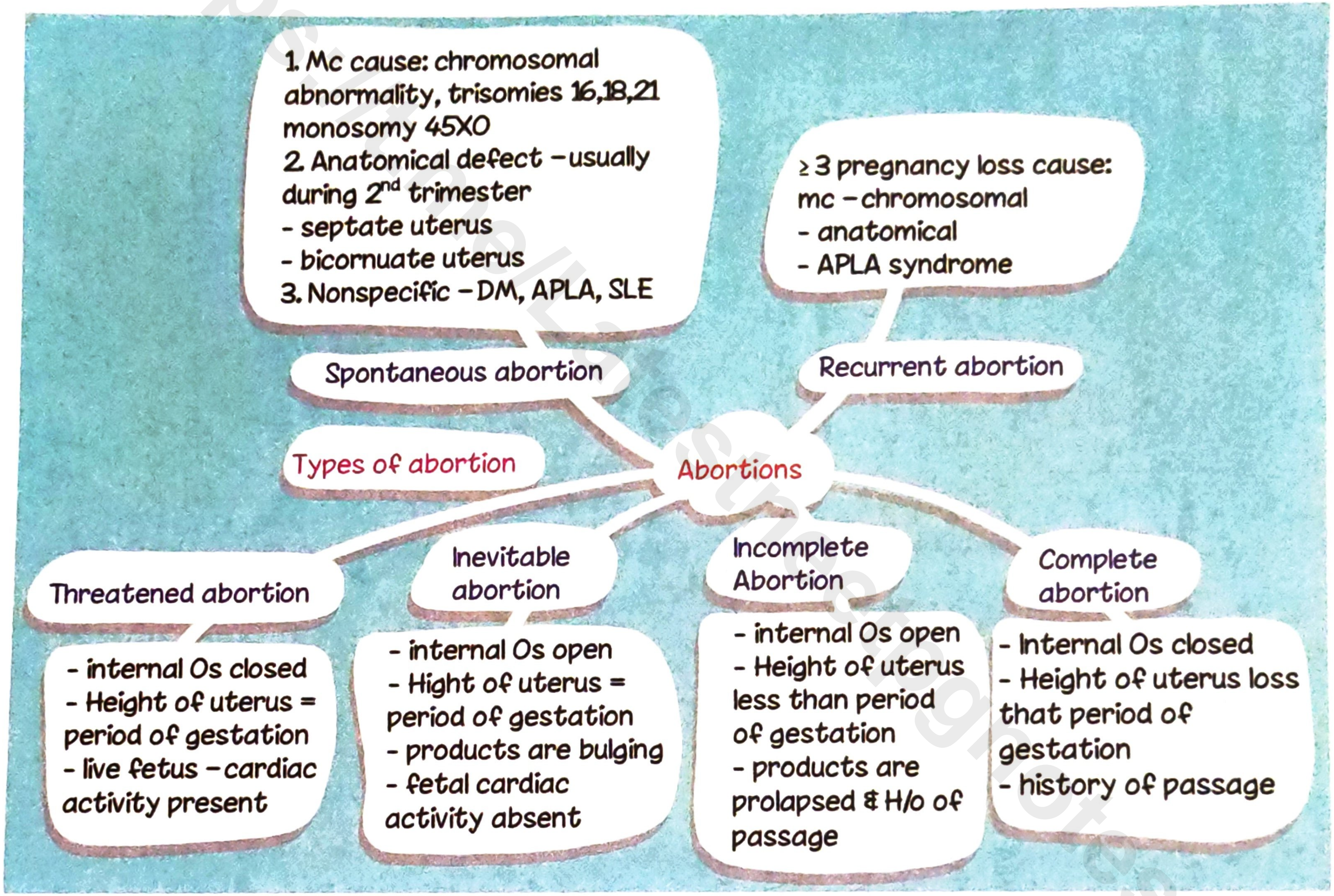
  } Outdated

LAMINARIA TENTS

- Dried sea weeds
- Imbibe fluids & swell up
- Hygroscopic Action

SURGICAL METHOD → HYSTEROTOMY

In case of failure of above procedures



**Abortions**

**Types of abortion**

- **Spontaneous abortion**
  - 1. Mc cause: chromosomal abnormality, trisomies 16,18,21 monosomy 45XO
  - 2. Anatomical defect – usually during 2nd trimester
    - septate uterus
    - bicornuate uterus
  - 3. Nonspecific – DM, APLA, SLE
- **Recurrent abortion**
  - ≥ 3 pregnancy loss cause:
  - mc – chromosomal
    - anatomical
    - APLA syndrome
- **Threatened abortion**
  - internal Os closed
  - Height of uterus = period of gestation
  - live fetus – cardiac activity present
- **Inevitable abortion**
  - internal Os open
  - Hight of uterus = period of gestation
  - products are bulging
  - fetal cardiac activity absent
- **Incomplete Abortion**
  - internal Os open
  - Height of uterus less than period of gestation
  - products are prolapsed & H/o of passage
- **Complete abortion**
  - Internal Os closed
  - Height of uterus loss that period of gestation
  - history of passage

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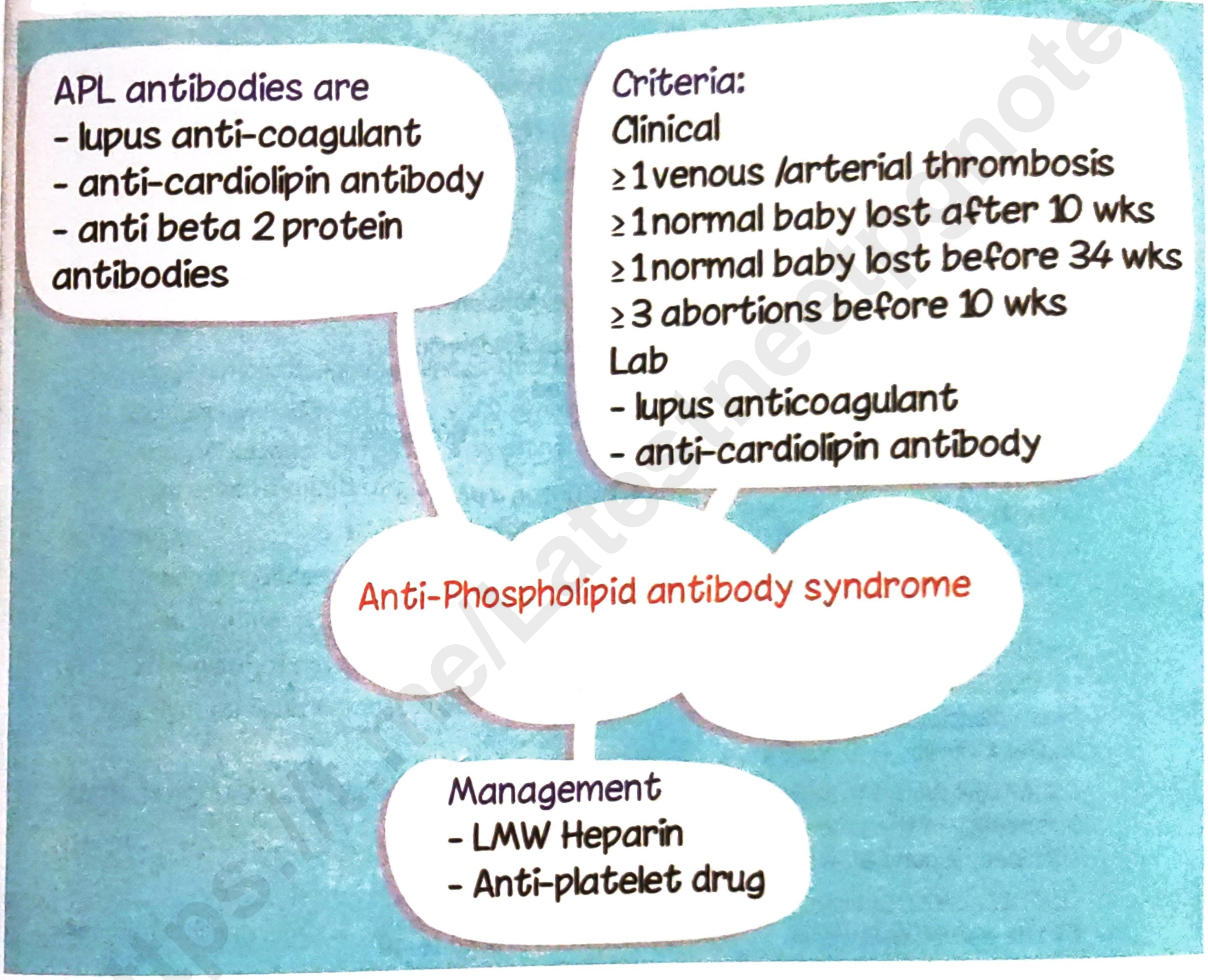


APL antibodies are
- lupus anti-coagulant
- anti-cardiolipin antibody
- anti beta 2 protein antibodies

Criteria:

Clinical

≥1 venous /arterial thrombosis
≥1 normal baby lost after 10 wks
≥1 normal baby lost before 34 wks
≥3 abortions before 10 wks

Lab
- lupus anticoagulant
- anti-cardiolipin antibody

Anti-Phospholipid antibody syndrome

Management
- LMW Heparin
- Anti-platelet drug

# Chapter 18

## PHYSIOLOGICAL CHANGES OF PREGNANCY

### UTERUS

00:00:50

Non Pregnant Uterus → 70 grams

Pregnant Uterus at term → 1100 grams

Uterine Hypertrophy is d/t → Estrogen (mainly); Progesterone

Uteroplacental blood flow → ↑ progressively in pregnancy

Range → 450 - 650 ml/min near term

Uterine artery flow/ min → 500 ml (each)

Elemental Iron required → 1000 mg

- 500 mg for Hb expansion
- 300 mg for fetus & placenta
- 200 mg is wasted

### CERVIX

00:03:44

- ESTRADIOL Stimulate growth of columnar epithelium on the cervical canal so it becomes violet & is called ECTROPION
- CHADWICK SIGN (JACQUEMIER'S SIGN) is bluish discoloration of vagina & Cervix, 6-8 weeks
- OSLANDER (VAGINAL SIGN), pulsatality in the lateral fornices, around 8th week
- GOODELL SIGN, Softening of the cervix, 6-8 weeks
- PLACENTAL SIGN:
  - LMP-25/8, pregnant on 25/9
  - Spotting P/V on expected date of periods 1 month later from LMP
- HEGAR SIGN: on a p/v, the abdominal & vaginal fingers seems to oppose below the body of Uterus, 6th week
- HARTMANS SIGN: Implantation bleeding
- PALMERS SIGN: Rhythmic uterine contractions felt in early pregnancy
- BRAXTON HICKS contractions around 16-18 weeks

## BREAST

00:09:23

- Breast ductal growth → Estrogen
- Breast alveolar cells & sebaceous glands → Progesterone
- Prolactin leads to → Active secretion of milk after birth
  → Levels ↑ ↑ ↑ in pregnancy
  → Levels Normal in Puerperium

* PRL levels peak only during breast feeding when baby sucks breast & than come to normal

* Sex steroids (E & P) reduce & no more suppress PRL so that PRL acts better

- Breast tenderness & paresthesias ↑ ses
- Nipples
  - Larger, more deeply pigmented & more erectile
  - Colostrum (thick yellowish fluid) starts to get secreted from end of second trimester & begining of third trimester & is expressed by gentle massage
- Areola
  - Become broader
  - Glands of Montgomery
    - No. of small elevations
    - Hypertrophic sebaceous glands

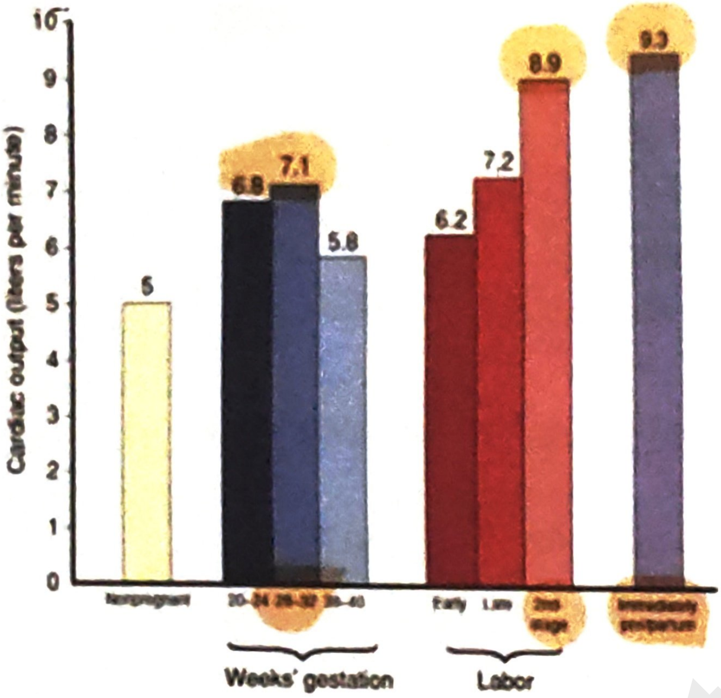
## CARDIO VASCULAR SYSTEM

00:12:13

Heart → Moves upwards & outwards
→ Hypertrophy of cardiac muscle

Apical Impulse → Lateralized (Goes from Mid Clavicular line to Anterior Axillary line)

Cardiac output → Starts ↑ ing by as early as 5th week
→ Increased by 30% (6 Ltr /min)
→ Reaches to peak at 32nd - 34th week



Early or mid pregnancy BP → ↓

Late pregnancy BP → ↑

Heart Rate → ↑ (10-20%)

Stroke volume → ↑ (10%)

Mean Arterial Blood Pressure → ↓ (10%)

(DBP + 1/3 pulse pressure (SBP-DBP)

Peripheral Resistance → ↓ (35%)

- SUPINE HYPOTENSION SYNDROME
  - In approx. 10%, Supine compression of great vessels by Uterus causes significant arterial hypotension.

## HEART SOUNDS

1st Heart Sound → Exaggerated splitting of 1st heart sound
→ ↑ ed loudness of both components

3rd Heart Sound → Loud & easily heard
→ d/t rapid filling of Ventricles

## MURMURS

Systolic murmur → >95% develop it, disappears after delivery
→ Also seen in Anemia

Transient Diastolic murmur → 20% develops it

Continuous murmur → 10% develops it, d/t ↑ in Mammary blood flow

## HEMATOLOGY

00:19:17

### Blood volume

- ↑ by 30-45% at 32nd-34th wk (peak)
- Relatively diluted blood since RBC ↑ is only 20-30% i.e. volume ↑ is more as compared to RBC ↑ so blood is relatively dilute
- Contributing factors
  - ↑ Na retention
  - ↓ Thirst threshold
  - ↓ Plasma Oncotic pressure

### Red Cells

- Hb → from 130 → 110 g/L
- HCT → from 38 → 31%
- Albumin → ↓ 35 g/L

| Decrease in | Increase in |
|---|---|
| Red cell concentration<br>Hb concentration<br>Hematocrit<br>Plasma folate concentration | White cell count<br>ESR<br>Fibrinogen concentration |

### CLOTTING FACTORS IN PREGNANCY

- In pregnancy, there in increased concentrations of all clotting factors except factors XI & XIII.
- In Non-pregnant women : Plasma fibrinogen (F-1) averages 300 mg/dL (200-400 mg/dL)
- In Ⓝ pregnancy:
  - Plasma fibrinogen concentration ↑ 50%
  - In late pregnancy, it averages 450 mg/dL (300-600 mg/dL)

## RESPIRATORY SYSTEM

00:24:31

Diaphragm → Rises about 4 cm

The sub costal angle → ↑ from 68° to 104°

Respiratory Rate → No Change

Vital Capacity → No Change

Tidal volume → ↑ (40%)

FRC → ↓ (20% - 30%) (400 - 700 ml)

Inspiratory Capacity → ↑ (5-10%)

Total lung capacity → Unchanged (FRC + Inspiratory capacity)

$O_2$ Consumption → ↑ (20%)

## URINARY SYSTEM 00:26:53

Kidney size → ↑ by 1.5 cm

GFR → ↑ (50%)

- This Hyperfiltration is d/t Hemodilutation
  - ↓ Protein & ↓ Oncotic pressure
  - ↑ Renal plasma flow (50-60% ↑ in RPF)
- Glucosuria → may be seen as Renal glucose threshold ↓ in pregnancy to 150-160 mg/dL (Ⓝ-180 mg/dL)

Proteinuria → 300 mg/day or more in 24 hr urine

Serum creatinine levels → ↓ (0.7 to 0.5 mg/ dL)

Creatinine clearance → ↑ 30%, from 100 to 115 ml/min

Ureter → Dilated [d/t Gravid Uterus pressure & Progesterone (smooth muscle relaxant action)]

Bladder → frequent micturition ( ↑ pressure & ↑ Urethral length)

## GASTRO INTESTINAL SYSTEM 00:29:08

Pyrosis (Heart burn) → ↑

Gastric emptying time → Unchanged

The motility of large bowel → diminished resulting in constipation, ↑ Hemorrhoids

Liver function → Alkaline Phosphate doubled

→ SGPT, SGOT, GGT all are reduced

Serum Albumin Concentration → ↓

Total Albumin → ↑

Gall Bladder Contractility → ↓ ; ↑ Residual volume

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- → Progesterone impairs GB contraction by inhibiting Cholecystokinin - mediated smooth muscle stimulation
- → Intrahepatic Cholestasis & Pruritis gravidarum d/t Retained Bile Salts

## ENDOCRINE SYSTEM 00:31:31

- Pituitary (Hypertrophy)
  - Enlarges by approximately 135%
  - Estrogen induced Hypertrophy of Lactotrophs
- Serum PRL : 10 Fold of normal, around 150 ng /ml
- Gonadotrophs decline in number
- Corticotrophs & Thyrotrophs remain constant
- Somatotrophs are generally suppressed : Because Placenta is making lots of GH (Placental GH) which causes feedback inhibition of Somatotrophs
- Thyroid
  - TRH levels are normal, maternal TRH is transferred across the placenta & helps fetal pituitary to make TSH
  - TSH reduces in 1st trimester : in 80% women because of ↑ HCG levels ( $\alpha$ subunit of HCG ≈ $\alpha$ subunit of TSH)
  - TBG increases, zenith at 20th week
  - $fT_3$, $fT_4$ unchanged

## PSYCHIATRIC DISORDERS 00:39:24

### BLUES

- Occur within first few days and resolve by 2 weeks (50-60%)
- Due to sudden loss of Progesterone
- Characterized by mild mood swings, irritability, anxiety, decreased concentration, insomnia, tearfulness, crying spells in 85% of women for a short time in the immediate Postpartum period

### DEPRESSION

- Occurs in first 3-6 months (10-15%)

- Insomnia, anxiety, low self worth, unable to care for and bond with baby

## PSYCHOSIS

- Within first 2-3 months (< 1%)
- Severe insomnia, rapid mood swings, anxiety, psychomotor restlessness, delusions and hallucinations

## DIAGNOSIS OF PREGNANCY 00:32:56

Pregnancy tests detect HCG in mother urine or serum

Urine pregnancy Test → 60-70% sensitive

Radio Immune Assay (RIA)

- 100% sensitive
- Sensitivity to 2 mIU
- Positive since day 7th of ovulation

Serum HCG →Positive in around 94 – 95 % on the day of missed period

USG

| G-SAC | CARDIAC ACTIVITY |
|---|---|
| TVS 4+Weeks | 5+ weeks |
| TAS 5+ Weeks | 6 + weeks |

→ › 12 weeks FHS heard with fetal Doppler

→ › 24 weeks FHS heard with Stethoscope

→ Palpation of Fetal parts from 24th week

→ Fetal movement may be felt during palpation

BRAXTON HICKS CONTRACTIONS → Irregular painless contractions palpable after 20th week

## PUERPERIUM 00:35:48

1 week → Uterus weighs approx. 500 gms.

2 weeks → Uterus weighs about 300 gms.

4 weeks → Uterus weighs 100 gms.

6 weeks → Involution is complete

## LOCHIA 00:36:07

LOCHIA RUBRA → First few days of delivery, sufficient blood

For more notes visit

Or click this page to visit the channel

→ Red

LOCHIA SEROSA → After 3 to 4 days
→ PALE

LOCHIA ALBA → After approx. 10th day
→ d/t mix. of leukocytes
→ White or Yellow White

## INVOLUTION

00:36:48

At Delivery → Uterus is at the level of Umbilicus (20-22 weeks)
At 2 weeks → In Pelvis
At 6 weeks → Normal Organ
Rate of Involution → 1-2 cm/day

## SUB INVOLUTION – CAUSES

00:39:10

- Infection
- Retained Intra Uterine Products
- Fibroids

# Chapter 19

# DIAGNOSIS OF PREGNANCY

## CASE 1

00:00:30

- LMP 16th August & missed period on 16th September; Tests done for Dx of Pregnancy ?

1. Urine Pregnancy Test
   - ⊕ in 60-70% [sensitive to 150 mIU of HCG]
2. Serum HCG by ELISA
   - ⊕ in > 95% [sensitive to 5 mIU of HCG]
3. Radio Immune Assay
   - ⊕ in 100% [sensitive to 1-2 mIU of HCG]
   - Can Dx pregnancy on 7th day of ovulation
4. Immuno Radiometric Assay
   - ⊕ in 100% [sensitive to 0.5 mIU of HCG]
   - Can Dx from 7th to 10th day of Ovulation

## CASE 2

- LMP - 16th August & Missed period on 16th September; Period of Gestation on 16th September ?
  - PERIOD OF GESTATION IS CALCULATED FROM 1ST DAY OF LMP
  - POG = 4 weeks and 3 days
- Dx of Pregnancy on 4 weeks 3 days POG by

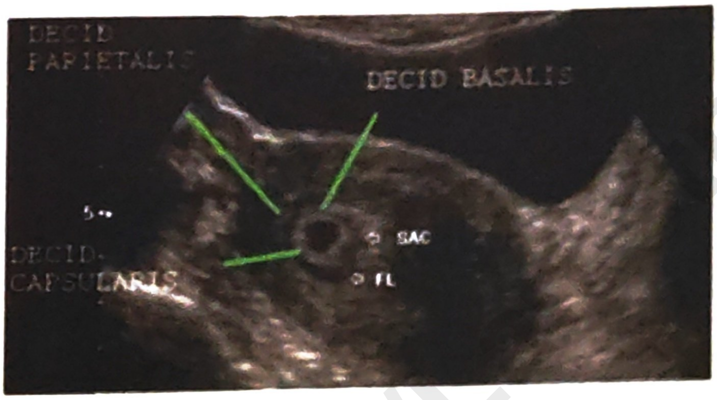
5. USG

| | Gestational Sac | Cardiac Activity |
|---|---|---|
| TVS (Trans Vaginal sonography] (Preferred) | → 4 + weeks | → 5 + weeks |
| TAS [Trans abdominal sonography] | → 5 + weeks | → 6 + weeks |

6. MRI → Trouble solver
7. Laparoscopy (Best)

8. HCG
- Doubling in 48 Hrs → Intrauterine pregnancy
- Doubling in 5-7 days → Ectopic Pregnancy
- Discriminatory Zone
  - HCG level beyond which we must see a sac
  - TVS → > 1500 IU
  - TAS → > 6500 IU

- DOUBLE DECIDUAL SAC SIGN ON USG
  - Intrauterine sac (Eccentrically placed)
  - Outer Layer → Decidua Parietalis
  - Inner Layer → Decidua Capsularis
  - Indicates → Intrauterine pregnancy



00:13:44

SYMPTOMS
- Bloating
- Morning Sickness
  - Nausea
  - Vomiting
- ↑ Urinary frequency
- Constipation

SIGNS

BREAST CHANGES
- Breast size → ↑
- Breast ductal growth → Estrogen
- Breast alveolar cells & sebaceous glands → Progesterone
- Prolactin leads to
  - Active secretion of milk after birth
  - Levels ↑ ↑ ↑ in pregnancy
  - Ⓝ in Puerperium

- Breast tenderness & paresthesias ↑ ses
- Nipples
  - Larger, more deeply pigmented & more erectile
  - Colostrum (yellowish fluid) expressed by gentle massage in few months.
- Areola
  - Become broader
  - Glands/ Tubercles of MONTGOMERY
    - No. of small elevations
    - Hypertrophic sebaceous glands

In $2^{nd}$ Trimester

- Quickening (22-24 wks in Primigravida); (20 wks in Multigravida)
- Uterine souffle } around 24 weeks
- Funic (umbilical) souffle } around 24 weeks
- Internal Ballotment → around 16-18 wks
- External Ballotment → around 22-24 wks

In $3^{rd}$ Trimester (> 28 wks)

- Fetal Heart sound heard by Fetoscope / Stethoscope
- Fetal parts can be felt
- Fetal movements can be felt

DIAGNOSTIC SIGNS OF A NON -VIABLE PREGNANCY BY TVS 00:20:00

1. Gestational Sac → ≥ 25 mm size with no yolk sac or fetal node (Pole)

2. Crown rump length → ≥ 7 mm with no cardiac activity

4. G. Sac Present → ≥ 2 wks later → No embryo seen, no cardiac activity

5. G. Sac + Yolk Sac present → ≥ 11 days later → No embryo seen, no cardiac activity

6. Unusually large Yolksac → ≥ 7 mm (Fetal node is either not formed & if formed then does'nt survive)

## Chapter 20

# PRENATAL DIAGNOSIS

### USG

00:01:51

1st Trimester [Up to 12 weeks]

- Can assess formation of normal fetus & presence of gross fetal structure
- Only NTDs can be detected are → Anencephaly & Acrania

2nd Trimester

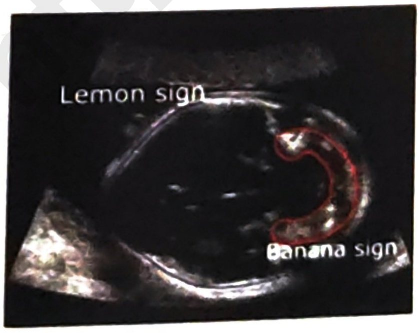
- Targeted scanning for specific defects can be done
- Soft markers for Down syndrome

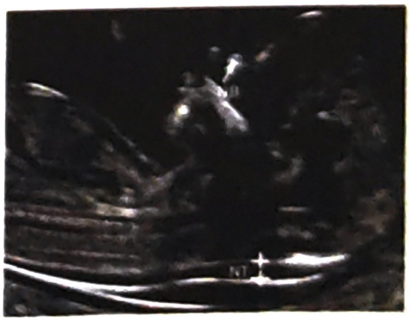
- Brachycephaly
- Clinodactyly (short 5th digit)
- Short femur
- Short humerus
- Echogenic focus in Ventricle
- Single Transverse Palmar crease (Simian crease)
- Nasal bone absence
- Thick Nuchal fold
- Flat facies
- Echogenic bowel
- Sandal gap

- Markers for Spina Bifida

– Scalloping of frontal bones → Lemon Sign
– Forward curvature of Cerebellum → Banana Sign

- Nuchal translucency > 3 mm → Suggestive of Down syndrome
- > 14 weeks → Nuchal fold > 6 mm → Suggestive of Down Syndrome
- Absent Nasal bone → Suggestive of Down Syndrome





## BIOCHEMICAL MARKERS FOR DOWN SYNDROME

Up to 12 weeks

- HCG → ↑
- PAPP-A → ↓

From 16th week onwards

### TRIPLE MARKER

| | Median Values | Measured Values |
|---|---|---|
| HCG | x | ↑ |
| $UE_3$ | y | ↓ |
| α FP | z | ↓ |

- Expressed in MoM (Multiples of Median) units
- 60-70% sensitive

### QUADRUPLE MARKER

- Triple marker + Inhibin ↑
- 80% sensitive

  1st Trimester screening (HCG, PAPP-A) + Nuchal translucency → 80% sensitive

### INTEGRATED SCREENING (1st + 2nd trimester screening)

- 94-96% sensitive
- Best screening test

### CONFIRMATORY TEST 00:15:34

| | | |
|---|---|---|
| 1st Trimester | → | Chorionic Villus Sampling |
| 2nd Trimester | → | Amniocentesis |

### Cell Free Fetal DNA assessment / Non - Invasive Fetal Trisomy testing (NIFTy)/ Non Invasive Pre natal Testing (NIPT) 00:16:15

- After 12 weeks → Fetal DNA may be seen in maternal circulation
  - 98% sensitive
  - It is still not a diagnostic test

- NIPT
  - If −ve → Down syndrome can be ruled out
  - If +ve → Do confirmatory tests

## METHOD OF CHORIONIC VILLUS SAMPLING

- Done at 1st trimester (10-13th week)

Put a needle by Trans abdominal method

(Trans vaginal method is MC used)

↓

Take out fetal villi (Chorionic frondosum) and discard maternal villi

↓

Run the karyotype on the fetal cells & genetic analysis done

↓

Gives early diagnosis, but abortion chance is upto 2%

- If doing < 10 weeks can cause
  - Limb reduction defects
  - Oro mandibular defect

## METHOD OF DOING AMNIOCENTESIS

00:19:47

- Done at 16-18th weeks

Put a needle by Transabdominal method

↓

Take out Amniotic fluid around 20 ml, containing fetal skin cells

↓

On fetal skin cells → Do Karyotype & genetic analysis

- Abortion Rate → < 1%
- But diagnosis gets delayed as compared to Chorionic villus sampling

  *Karyotype results come after 7-10 days in both CVS & Amniocentesis

## EARLY AMNIOCENTESIS

- done b/w 13-15 weeks
- Abortion rate ≃ Chorionic villus sampling

## Per Cutaneous Umbilical Blood Sampling (PUBS)/ Cordocentesis

00:25:54

- done ≥ 18 weeks
- Usually done for
  - The assessment of Fetal anemia
  - Blood transfusion to the fetus
  - Fetal problems
- Invasive procedure

Umbilical vein near insertion into placenta

↓

Karyotype can be done in blood lymphocytes

- Gives result in 24-48 hours

*Assessment of Middle Cerebral Artery Velocity is better to assess fetal anemia

## α - FETO PROTEIN

00:30:09

- Glycoprotein
- Source → Yolk sac (Initially), Liver & Gut (later)
- ↑ till 13th weeks in fetal circulation and then reduces gradually
- In Maternal circulation α FP starts ↑ after 12th week
- Earlier ↑ α FP in amniocentesis is very sensitive for NTD
  ( This is now replaced by USG)
- Confirmatory test for NTD

→ Amniotic fluid Acetylcholinesterase

| α FP is higher in 00:32:59 | α FP is reduced in 00:33:56 |
|---|---|
| Duodenal atresia<br>Esophageal atresia<br>Osteogenesis imperfecta<br>NTD<br>Omphalocele<br>Gastroschisis<br>Cystic Hygroma | Fetal death (IUD)/ Abortion<br>Trisomy<br>Over estimated maternal age<br>Obesity<br>Trophoblastic Diseases<br>Aneuploidies |

## PREIMPLANTATION GENETIC SCREENING

- Indicated for high risk cases
- No H/O previous abortions/ genetic defects in previous babies

## PREIMPLANTATION GENETIC DIAGNOSIS

00:35:35

### INDICATIONS

1. Previous genetic defects
2. Recurrent abortion

### METHODS

1. **Blastomere Biopsy** (MC Method)
2. **Trophoectoderm Biopsy**
   - Trophoectoderm gives rise to placenta
   - Safer method
3. **Polar Body Biopsy**
   - Only maternal component present
   - Not preferred

# Chapter 21

## PRETERM LABOR

- Labor starting before 37 weeks
- 37-42 weeks → TERM
  40 wks → EDD [Expected date of delivery]
  → 4% of total deliveries
  >42 weeks → Post term
  >40-42 weeks → Past Dates
  <37 weeks → Pre term Labor
  <32 weeks → Severe PTL
  32-34 weeks → Usual PTL
  >34-36 [+6 D] weeks → Late pre term Labor

### DIAGNOSIS

00:02:24

- Uterine Contractions
  - 4 times in 20 min
  - 8 times in an hour
- On PV examination, if cervix
  - ≥1 cm dilated, >80% effaced
  - >3cm dilated, >80% effaced → Advanced pre term Labor
  - <3cm dilated, <80% effaced → Early pre-term Labor
  - 1 cm dilated, <80% effaced

  → Do Cervical examination
    - ○ TVS Cx → >2.5 cm → False Labor
    - ○ TVS Cx → <2.5 cm → Threatened PTL
- Incidence of PTL → 6-15% [~10%] of all pregnancies

### CAUSES

00:05:30

1. Infections [20-40%] → Pelvic inflammatory disease, UTI

### Causative Organisms

| | |
|---|---|
| Chlamydia | Bacterioids |
| Gonorrhea | Gardenella Vaginalis |
| Ureaplasma | E. Coli |
| Mycoplasma | Streptococcus |

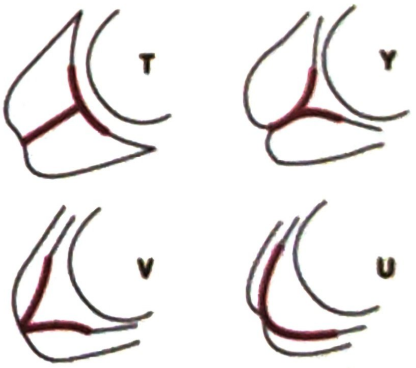
### CHRIOAMNIONITIS DIAGNOSIS

00:07:00

- Any 2 of following are present
  - ↑ Total Leucocyte count
  - ↑ C - Reactive protein → › 2.7 mg/dl
  - Uterine tenderness
  - ↑ Pulse rate
  - Foul smelling discharge

If subclinical (CRP › 1.6) → Do amniocentesis & culture sensitivity testing

2. Uterine Over Distention
   - Polyhydramnious
   - Twin pregnancy
   - Large Baby
3. Uterine Anomalies
   - Septate Uterus
   - Bicornuate uterus
4. Bleeding in Chorio-decidual space
5. MATERNO FETAL stress
6. Cervical Abnormalities
   - Incompetent Cervix
   - Cervical lacerations



FUNNELING OF CERVIX

## PREDICTION OF PTL 00:10:30

### 1. USG

- at 12-13 wks → Short cervix → < 2.5 cm
- around 29 wks → Funneling of cervix

* Cervical funneling is defined sonographically as protrusion of Amniotic membranes into the Internal Cervical Os by greater than 5 mm from the shoulder of the original internal Os as measured along the lateral border of the funnel

### 2. FETAL FIBRONECTIN

- Presence is normal → < 22 wks & > 37 wks
- If seen b/w 22-37 wks → Predictive of PTL
    - ○ 30% PTL in 1 week
    - ○ 41% PTL in 2 weeks

## NEW BORN COMPLICATIONS 00:16:10

- Respiratory Distress Syndrome (Hyaline membrane Disease)
- Intra Ventricular Hemorrhage
- Bronchopulmonary Dysplasia
- Necrotising Enterocolitis
- Neonatal deaths

## MATERNAL COMPLICATIONS

- Endometritis
- Puerperal sepsis

## MANAGEMENT 00:18:10

### 1. FOR LUNG MATURITY

a. STEROIDS → can be given IV/IM

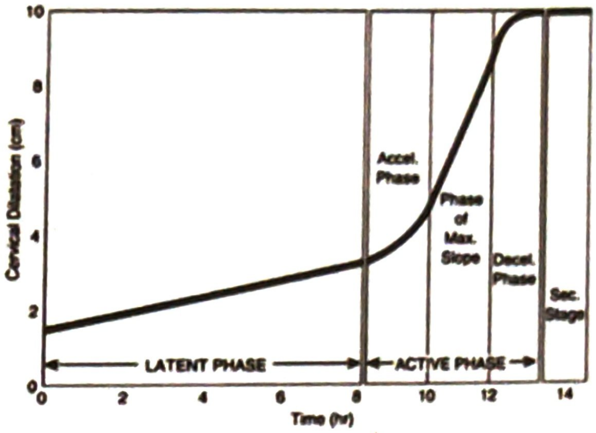
| | | | |
|---|---|---|---|
| - Dexamethasone | 6 mg | 12 hourly | 4 doses |
| - Betamethasone | 12 mg | 24 hourly | 2 doses |

b. ARTIFICIAL SURFACTANTS

- Post natally & by Intra tracheal route
    - ○ SURVATA (Bovine) (Calf)

- AXOSURF
- ALEC

2. TOCOLYSIS
   - Tocolytics acts only on latent phase of labor
   - Timing → < 3 cm & < 34 weeks
   - Purpose → To get time for lung maturity



LABOUR - PHASES

DRUGS

a. β Agonists
- Salbutamol
- Ritodrine
- Isoxsuprine

Side Effects
- Glycogenolysis }
- Lipolysis → } ↑ Sugar
- Pulmonary edema

b. Calcium Channel Blockers

Nifedepine
- First line & safest drug
- Start 30 mg orally & maintain with 20 mg

c. Calcium Antagonists

$MgSO_4$
- Side effect → Neonatal hypotonia
  Hypocalcemia
- Benefits → Neuroprotective

*Above 3 classes of drugs can cause Pulmonary Edema. Safest among them is Nifedepine

d. Oxytocin Antagonist

Atosiban

- Neonatal morbidity & mortality of PTL shows No Benefit with it.

e. Prostaglandin Synthetase Inhibitors

NSAIDS : Indomethacin

- 25 - 50 mg, once or twice a day
- Side Effects
  - Premature closure of Ductus Arteriosus
  - Do not give beyond 32 weeks

f. Progesterone

- Smooth muscle Relaxants
- Used for prophylaxis
- Transvaginal route is preferred

g. NO Donors : Nitroglycerine Patch

- Smooth muscle dilator
- Used in PTL & for prevention of IUGR
- Dose = 0.2 mg/hr to 0.4 mg/hr

f. Dizoxide

- Smooth muscle relaxant
- S/E
  - Hypotension in mother
  - Fetal distress
  - Hypotension is prevented by pre loading mother with 500-1000 ml Ringer Lactate

## LUNG MATURITY ASSESSMENT 00:39:20

- Lung is Matured when
- Lecithin Sphingomylein Ratio → › 2:1
- Phosphatidyl Glycerol (PG) present in Amniotic fluid
- Phosphatidyl choline present in Amniotic fluid
  - Best part of surfactant
  - ~ 70% of surfactant
  - Starts forming at 24 wks

- Formed by Type II Alveolar Pneumocytes
- PG is a storage form of surfactant fats so it starts forming only after adequate formation of Phosphatidyl choline

Phosphatidyl glycerol is the final indicator of Pulmonary maturity
Phosphatidyl glycerol present only in Amniotic fluid

- Phosphatidyl Choline present in
  a) Amniotic fluid
  b) Maternal serum
  c) Fetal serum
- Shake Test → Do Amniocentesis & take out the Amniotic fluid in a test tube & add Saponifying agent

↓

Fats in Amniotic fluid will convert into soaps

↓

On shaking, Bubbles are formed

Tap Test → Same as Shake test except that we tap test tube instead of shaking

Bubbles formed → Test is positive → Surfactant present

- Nile Blue Phosphate Test
- Sediment of Amniotic fluid centrifuge is taken → contain skin cells
- Skin cells are plated on a side

↓

Add Nile Blue Agent

- Skin cells with lipids → Orange colour
  - If > 50% are orange → Indicates Matured Lung

BASIC CONCEPT OF SHAKE TEST, TAP TEST & NILE BLUE PHOSPHATE TEST
- Amniotic fluid is assessed for skin fats
- If skin cells positive for skin fats, it also indicates the Lung fat production
- Both skin fat production & lung fat production are simultaneous processes.

NILE BLUE TEST → Lung Maturity assessment
NITAZINE PAPER TEST → PROM Assessment

## PREMATURE RUPTURE OF MEMBRANES ASSESSMENT 00:55:00

a. NITRAZINE PAPER TEST → Done for PROM (Pre mature Rupture of Membranes)

- PROM
  - ROM prior to onset of Labor
  - SF ROM is before 37 wks → Pre-term PROM
- Blue
  - If Amniotic Fluid (Alkaline) in Vagina
  - There is leak of Amniotic fluid in vagina d/t PROM

↓

Give Antibiotics to prevent infection & try to induce labor in 24-48 hrs

Red
- If Vaginitis (Acidic)
- No leak in Vagina
- Woman can continue pregnancy

b. Fetal Fibronectin → Presence of Fetal Fibronectin in Vaginal secretions indicate PROM

c. ↑ Alpha Feto Protein

d. Ferning of the fluid from Vagina

e. Indigo Carmine Dye Test

- Inject dye into Amniotic sac & place a pad in maternal perineum

↓

Tell the woman to move around for 10-15 mins

↓

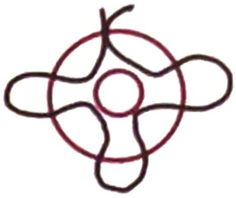
If there is leakage, dye would come out in secretions & stain the pad Indigo-bluish in colour

## PREVENTION OF PRE TERM LABOR 01:03:04

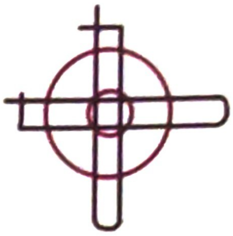
1. Prophylactic Antibiotics
2. Prophylactic Progesterones
3. CERCLAGE
   - Applied when cervix is < 2.5 cm

- Applied anywhere after › 12 weeks
- Removed ≥ 37 weeks

METHODS



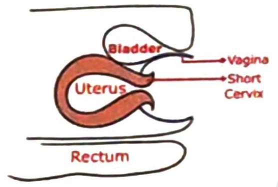
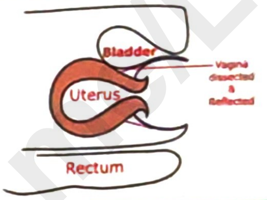
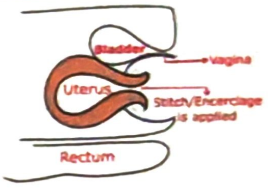
**MC DONALD'S CERCLAGE [MC]**



**WORM'S STICH**

- SHIRODKAR STITCH
  - For very short or mutilated Cervix
  - Dissect the vagina, apply the stitch & put vagina back to its place
  - Can be done Transvaginally or Trans-Abdominal
  - Mode of delivery → Cesarean section mostly

*Stitch around Cervix is k/as CERCLAGE/ ENCERCLAGE

| | | |
|---|---|---|
|  |  |  Bladder<br>Vagina<br>Uterus<br>Stitch/Encerclage is applied<br>Rectum |
| **Short Cervix hardly have space to apply Cerclage** | **Dissect & Reflect the Vagina (from upwards as well as posteriorly)** | **Apply the stitch & put the Vagina back to its place** |

https://t.me/Latestreetpgnotes

## Chapter 22

# PRE CONCEPTION AND PRE NATAL DIAGNOSTIC TECHNIQUES (PCPNDT) ACT

- Previously known as PNDT Act
- Formulated in 1994
- In effect on 1st Jan 1996
- Amended in 2002 & 2003
- Intended to stop Female Feticide (Prohibition of Sex selection)
- Sex Ratio (Female : Male)
  - India → 943/1000
  - Haryana → 877/1000
  - Daman & Diu → 618/1000

### BASIC PURPOSE 00:03:54

- Prohibition of preconception and pre natal diagnostic techniques for determination of sex of fetus, leading to female feticide
- Prohibition of advertisement of PNDT techniques for detection or determination of sex
- Permission & regulation of use of PNDT techniques for purpose of detection of specific genetic abnormalities or disorders
- Permitting use of such techniques only under certain conditions by registered institutions

### FEMALE FETICIDE 00:04:48

- Aborting a female fetus after sex determination
- Problem of Female feticide is
  - ↑ violence against women

  - Abortion due to family pressure
  - More men in society due to sex selective abortion

## THE TESTS WHICH ARE IN QUESTION

- Ultrasonography
- Fetoscopy
- Taking samples of Amniotic fluid
- Embryo, blood or any tissue or fluid of pregnant women assessed before or after conception
- Testing samples in genetic laboratory to detect genetic disorders, abnormalities or sex linked diseases.

## CLINICS, MEDICAL PERSONNEL & SALE OF MACHINES: UNDER THE ACT

- Only registered genetics clinics can use prenatal diagnostic techniques
- Procedures can be done by a qualified medical practitioner
- Prohibition on sale of ultrasound machine to unregistered laboratories, clinics & persons

## ADVISORY COMMITTEE

### CONSISTS OF

- 3 Medical experts
  - Gynaecologists & Obstetricians
  - Pediatricians
  - Medical Geneticist
- 1 Legal Expert
- 1 Officer to represent the department dealing with information & publicity of State Government.
- 3 Eminent social workers, at least one from the women's organizations

## APPROPRIATE AUTHORITIES

00:07:33

### STATE APPROPRIATE AUTHORITY

- Consists of 3 members

1. Additional Director of Health Services (Chair Person)
2. 1 Officer from Law Department
3. Other eminent women activist

*DISTRICT & CORPORATION AUTHORITIES are also present

### POWER OF APPROPRIATE AUTHORITIES

- Registration of Institutions
- Seal & Seize
- Power of search & seize records
- Cancellation or suspension of registration of Clinic/ Hospital

### PNDT can be used for detection of abnormalities like

- Chromosomal abnormalities
- Genetic metabolic diseases
- Hemoglobinopathies
- Sex linked genetic diseases
- Congenital abnormalities
- Only other abnormalities

### PNDT IS INDICATED WHEN

00:11:44

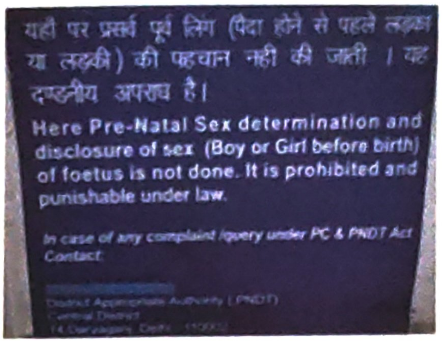
- Age of pregnant women is above 35 years
- 2 or more spontaneous abortions
- Pregnant women has been exposed to drugs, radiation, infection or chemicals
- Family history of Mental retardation or physical deformities in previous offspring

### ESSENTIAL COMMUNICATIONS

- Explanation of all known side/after effects & test procedures
- Written consent in prescribed form & its copy given to patient
- Not to disclose sex of fetus by Words, signs etc.
- Display prominently in local language that disclosure of sex of fetus prohibited under law
- Registration certificate to be displayed prominently in the clinic

## AN UNDERTAKING

- That the genetic counselling center, genetic clinic & Genetic laboratory shall display prominently a notice that they do not conduct any techniques, test or procedure etc by whatever name called, for detection of sex of fetus or for selection of sex before or after conception.

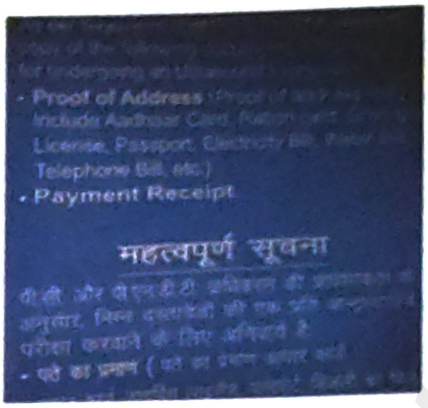


यहाँ पर प्रसव पूर्व लिंग (पैदा होने से पहले लड़का या लड़की) की पहचान नहीं की जाती । यह दण्डनीय अपराध है।

Here Pre-Natal Sex determination and disclosure of sex (Boy or Girl before birth) of foetus is not done. It is prohibited and punishable under law.

*In case of any complaint /query under PC & PNDT Act Contact:*

District Appropriate Authority ( PNDT)
Central District
14 Daryaganj, Delhi - 110002



- Proof of Address
Telephone Bill, etc.)
- Payment Receipt

महत्वपूर्ण सूचना

Husband & Relatives can not ask or encourage pre - natal diagnostic techniques except for reason permitted under law

## FORM A

- Prescribed application form which is to be filled in duplicate affidavit assuring that the center will not indulge in sex determination.

## RENEWAL OF REGISTRATION

- The certificate is valid for 5 years.
- Application for renewal has to be made 30 days before the date of expiry in the prescribed Form A

## MAINTAINING PROPER DOCUMENTS

### FORM G & F

- Prescribed formats in which genetic & ultrasound clinics have to maintain records
- Every center has to maintain a register of forms F & G for every patient

### FORM G

- The pregnant lady gives an undertaking that she does not want to know the sex of fetus

For more notes visit

Or click this page to visit the channel

## THE SONOLOGIST

- Also sign a declaration that he has neither detected nor disclosed the sex of the fetus to anybody

## COMPLETE REPORT

- All pregnancy related procedures information to be sent to the authorities by the 5th day of following month
- All the records have to be preserved for a minimum period of 2 years or in the event of any legal proceeding, till the final disposal of the legal proceeding

## INFORM ABOUT THE CHANGES

Genetic laboratory, Genetic clinic / Genetic counseling center shall intimate of Change

- of employees
- places or
- equipment

} WITH IN 30 DAYS

## VIOLATION OF THIS ACT

00:24:45

- Imprisonment of 3 years & Rs. 10,000 (50,000) fine, but subsequent conviction punishable with imprisonment for 5 years & Rs. 50,000 (1,00,000) fine.
- Offence to be Cognizable, Non-Bailable & Non-Compoundable
  Non-Compoundable means the parties involved can not take the case back i.e. no out of court settlement of case

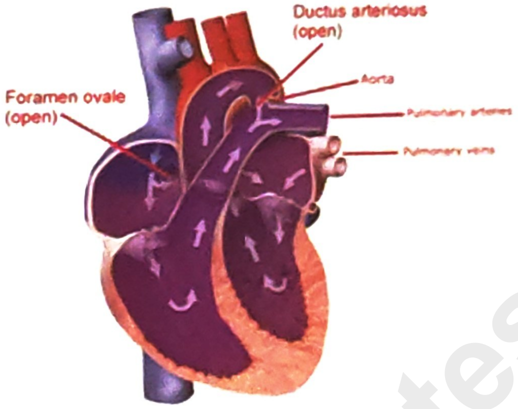
## Chapter 23

# FETAL CIRCULATION

## ADULT CIRCULATION - A RECALL

00:01:12

Fetal Heart



Right heart (De-oxygenated blood)

↓

Lungs

↓

Blood gets oxygenated

↓

Pulmonary Veins

↓

Left Atrium (Oxygenated blood)

↓

Left Ventricle

↓

Blood sent to all over the body via AORTA

Adult Heart → Works as series
Fetal Heart → Works as Parallel

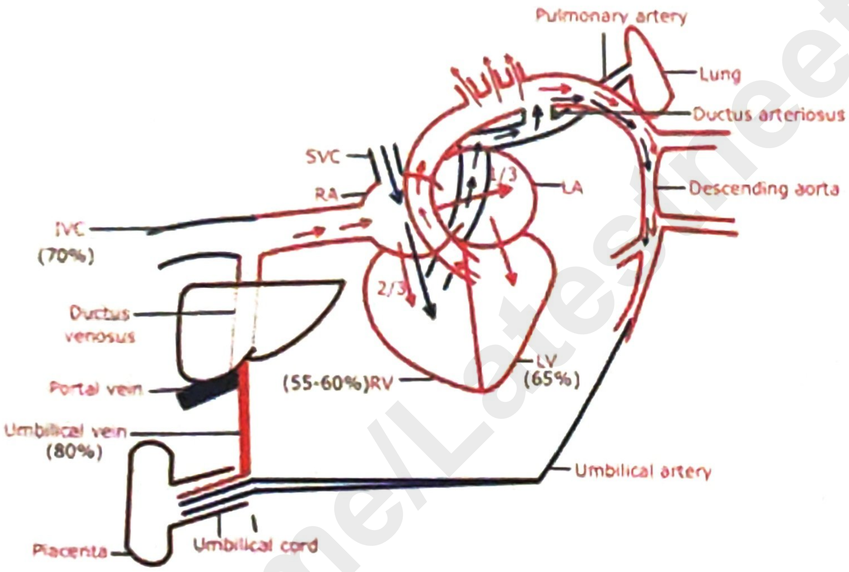
## Fetal Circulation

00:02:08

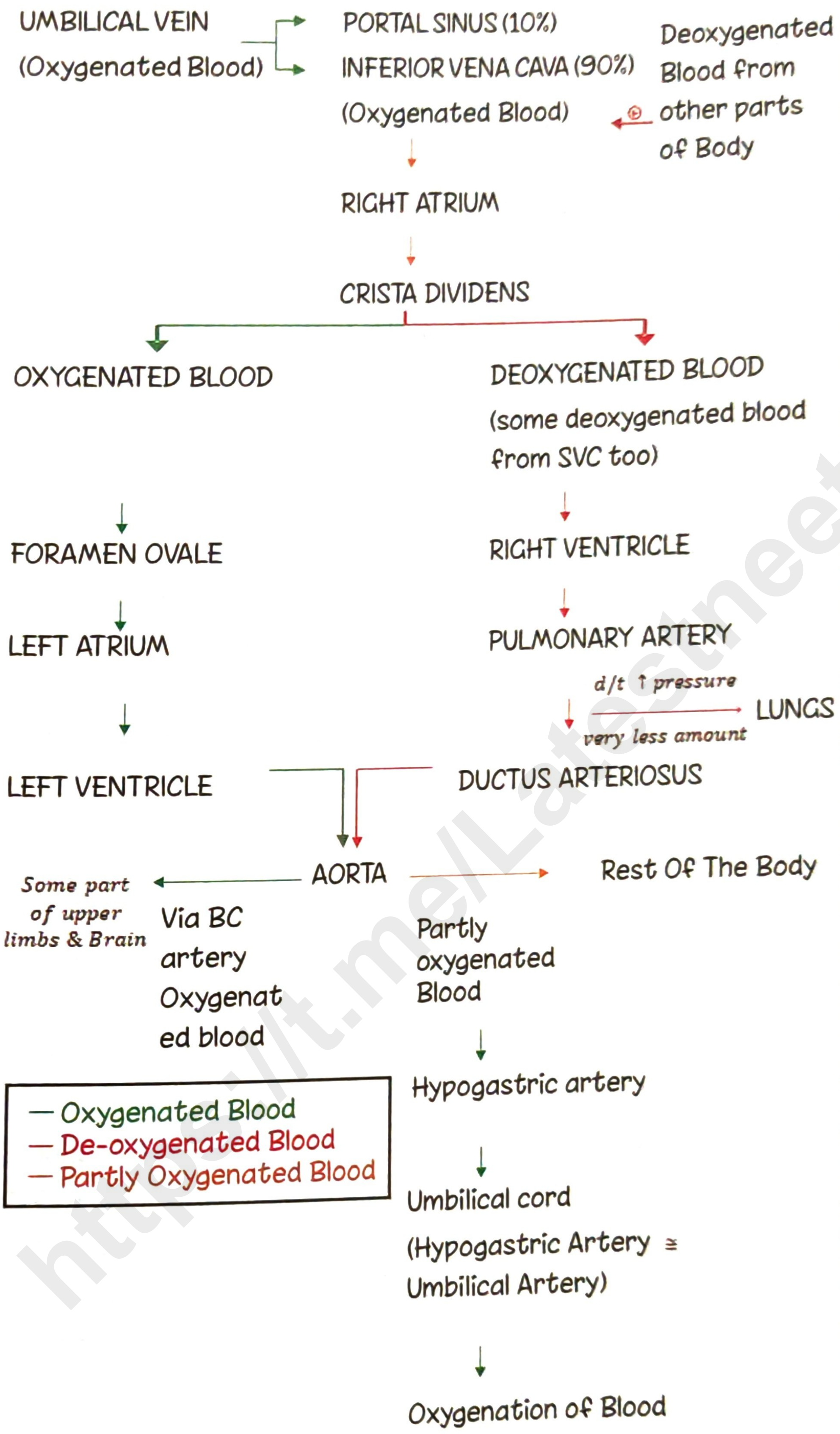
- Oxygen exchange occurs in placenta
- Umbilical artery carries deoxygenated blood
- Umbilical vein carries oxygenated blood

## Umbilical Cord

- Contains
    - 2 arteries
    - 1 Vein [Right vein obliterated, left vein persists; "Left Vein Left Behind"]



00:03:33



UMBILICAL VEIN
(Oxygenated Blood)

PORTAL SINUS (10%)
INFERIOR VENA CAVA (90%)
(Oxygenated Blood)

Deoxygenated
Blood from
other parts
of Body

RIGHT ATRIUM

CRISTA DIVIDENS

OXYGENATED BLOOD

FORAMEN OVALE

LEFT ATRIUM

LEFT VENTRICLE

DEOXYGENATED BLOOD
(some deoxygenated blood
from SVC too)

RIGHT VENTRICLE

PULMONARY ARTERY

*d/t ↑ pressure*

LUNGS

*very less amount*

DUCTUS ARTERIOSUS

AORTA

*Some part*
*of upper*
*limbs & Brain*

Via BC
artery
Oxygenat
ed blood

Rest Of The Body

Partly
oxygenated
Blood

Hypogastric artery

Umbilical cord
(Hypogastric Artery ≅
Umbilical Artery)

Oxygenation of Blood

— Oxygenated Blood
— De-oxygenated Blood
— Partly Oxygenated Blood

## Events After Birth 00:09:48

| Structure | Physiological closure | Anatomical closure | Remnant |
|---|---|---|---|
| Ductus venosus | 10-96 Hrs after birth | 2-3 weeks of life | Ligamentum venosum |
| Ductus arteriosus | 10-15 Hrs after birth | 15-21 days (~3months also) | Ligamentum arteriosus |
| Foramen ovale | At birth | 3 months (within 1st year) | Fossa ovalis |

## Fate of: 00:16:51

- Umbilical Vein → Ligamentum Teres (Round ligament of Liver)
- Umbilical Arteries/ Hypogastric artery → Umbilical Ligament

## Chapter 24

# Amniotic Fluid Dynamics

### Contributors of Amniotic Fluid

00:00:27

Maternal Contribution → In early pregnancy

Fetal Contribution → Fetal Skin

→ Fetal Urine (18-20 weeks onwards)

1. Urine → 1000 ml (+)
2. Lung Secretion → 350 ml (+)
3. Fetal swallowing → 750 ml (-)
4. Intra membranous Fluid transport across the Fetal blood vessels on the surface of Placenta → 400 ml

### Amniotic Fluid Properties

- pH → Alkaline [7.4 - 7.6]
- Specific Gravity → 1.008 - 1.010
- Colour → Straw colored

### Types of colours of Amniotic Fluid & Associated Conditions

1. Red → Ante-partum Hemorrhage (Abruption)
2. Green → Meconium stained liquor
3. Yellowish green → Post term pregnancy
4. Tobacco Juice → IUD
5. Golden Yellow → Rh isoimmunization

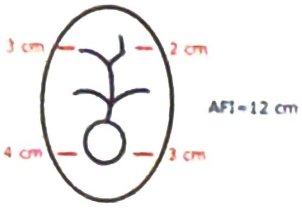
## Amniotic Fluid Index (On USG) 00:05:47

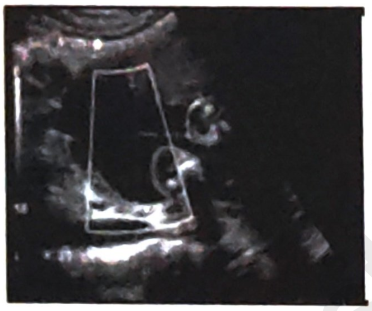
Normal Amniotic Fluid Index → 10-15 (range 5-24) (1000 ml)
Oligohydramnios → <5 (<500 ml)
Polyhydramnios → >25 (>2000 ml)

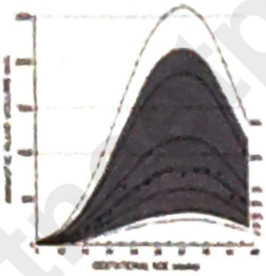
### Single Pocket Criteria

→ Cord free & limb free pocket is assessed

Oligohydramnios → <2 cm
Polyhydramnios → >8 cm







### Amniotic Fluid Volume Vs. Gestational Age

- Maximum at → 32-34 weeks (1000 ml)
- At 36 weeks, AF is less than 32 weeks → External cephalic version is possible
- Around 40 weeks → 600 ml

## Oligohydramnios 00:12:34

### Causes

1. Renal anomalies
2. IUGR pregnancy
3. Preeclampsia
4. Premature rupture of membranes
5. Amniocentesis → Leak
6. Amnion nodosum
7. Post term
8. NSAIDS
9. Ace inhibitors

- <5 AFI → Oligohydramnios
- No liquor → Anhydramnios
- 5-8 AFI → Mild Oligohydramnios

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### Management

→ ↑ Fetal Surveillance

→ Wait for lung maturity → Early delivery

→ Amnio - infusion

### Potter's Triad

→ Pulmonary hypoplasia

→ Renal anomalies

→ Contracted & malfigured limbs & flat / compressed faces

→ Seen in severe Oligohydramnios

→ Cause of Oligohydramnios is Renal anomalies

### Potter Sequence

→ Pulmonary hypoplasia

→ Contracted & malfigured limbs & flattening of Faces

→ Renal anomalies absent

→ Cause of Oligohydramnios is other than Renal anomalies

### Polyhydramnios

00:19:30

| | |
|---|---|
| • Liquor | → >25 AFI or > 2 liters of Amniotic fluid |
| • Acute Polyhydramnios | → Polyhydramnios seen < 24 weeks of gestation |
| • > 25-30 AFI | → Mild Polyhydramnios (MC) |
| • > 30-35 AFI | → Moderate Polyhydramnios |
| • > 35 AFI | → Severe Polyhydramnios (mostly a/w anomalies) |

### Causes

- Diabetes
- Twin gestation
- Cleft lip palate
- Duodenal atresia
- Esophageal atresia
- Neural tube defects
- Gastroschisis
- Chorioangioma of Placenta

Signs & Symptoms (Maternal)

- → Dyspnea
- → Orthopnea
- → Respiratory distress

Treatment

1. Indomethacin (25 mg TID)
   - → ↓ output of Urine from Fetus
   - → Should not use beyond 32 weeks
2. Theurapeutic Amniocentesis
   - → In a single setting, 1500 ml of Amniotic Fluid can be aspirated over 30 mins.
3. Controlled Artificial Rupture Of Membranes In Labor

# Chapter 25

# LABOR

## LABOR-A

**Parturition:** 4 phases

### Phase I

- Quiescent / Dormant phase
- 95% of pregnancy is spent in this phase
- This phase is Prelude to labor
- Progressive softening of Cervix occurs

### Phase II

- Activation phase / Preparation for delivery
- Cervical ripening occurs

### Phase III

- Stimulation phase / Process of delivery

### Stages of Labor

**Stage 1** → From onset of contractions to full dilation of Cervix

**Stage 2** → From full dilation of Cervix to delivery of Fetus

**Stage 3** → From delivery of Fetus to delivery of Placenta

**Stage 4** → Observation for 1 hour

### Phase IV

- Recovery phase / Involution phase / Puerperium
- Events occurring in phase IV
  - Uterine involution
  - Spontaneous repair of Cervix
  - Breast feeding

## Stage I

### Latent Phase

- Generally around 8 hrs

### Active Phase

→Generally around 4-6 hrs

→ Includes

- Acceleration phase
- Phase of max. slope
- Deceleration phase
- Second stage

* Latent Phase + Acceleration Phase (of Active Phase)

↓

Constitutes Preparatory division of labor

* Phase of maximum slope →Dilatational division of labor

* Deceleration Phase + 2nd stage of labor

↓

Pelvic division of labor

| | Nullipara | Multipara |
|---|---|---|
| Prolonged latent phase | >20hrs | >14hrs |

### Active phase disorders

| | | |
|---|---|---|
| Protracted dilatation | <1.2cm/hr | <1.5cm/hr |
| Protracted descent | <1cm/hr | <2cm/hr |

Arrest of dilatation → No dilatation for >2hrs

Arrest of descent → No descent for >1hr

### Maximum duration (Stage I & Stage II of labor combined):

| | | |
|---|---|---|
| Nulliparous | Mean - 9 Hours | Upper - limit 18.5hrs |
| Multiparous | Mean - 6 hours | Upper - limit 13.5hrs |

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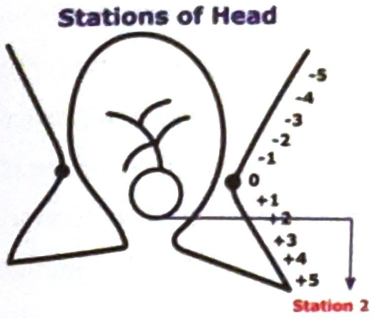
## Monitoring of Labor

**Station of Labor** (Ischial spine is the reference point)

* Ischial spine is narrowest space of Mid pelvis



### Timing of per Vaginal examination

→ When the Cervix is dilated > 4 cm &
regular contractions present

→ 2 hourly Pelvic examination
in Active phase

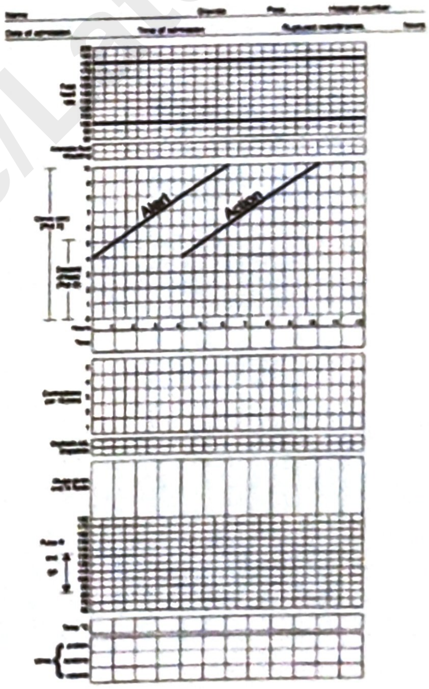
→ Partogram (WHO)

- With partogram, we can monitor the progress of labor
- Partogram charting is started at 4cm Cervical dilatation
- Early warning system
- Following decisions can be taken if labor progression is slow

i) Decision to transfer to a better center if labor progression is not going well

ii) Augmentation of labor (intervention to augmentation by Oxytocin etc.)

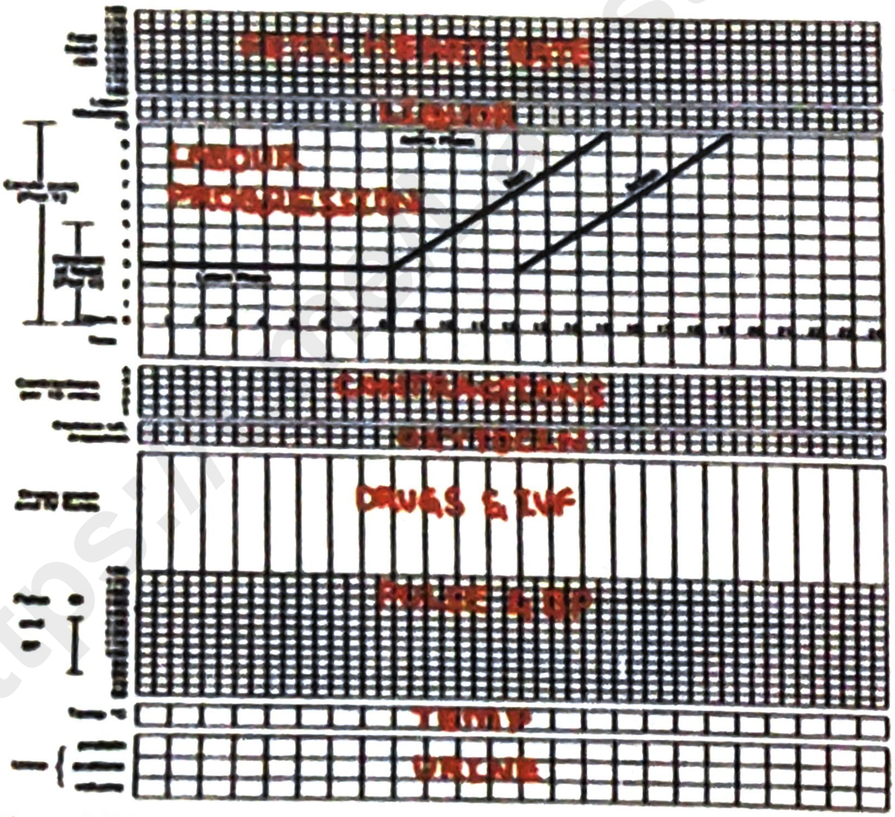
iii) Termination of labor → If suggestions of obstruction have started coming in Partograph



- Alert line
- Action line

} Reference lines to check the progress of labor

- We can monitor
  - Cervical dilatations } Progression of labor
  - Descent of head
  - Fetal Heart Rate
  - Liquor
  - Contractions
  - Oxytocin administration
  - Drugs & IV fluids administration
  - Pulse rate, BP
  - Temperature
  - Urine output etc.



Plotting of Uterine contractions on Partograph

- <20sec →Dotted lines (mild contraction)
- 20-40sec →Horizontal lines (moderate contraction)
- >40sec →Full shade (strong contraction)

https://t.me/aiimsneetpgnotes

## Uterine contractions

| | |
|---|---|
| <20 sec | ░ |
| 20-40 sec | ▤ |
| >40 sec | ■ |

## Benefits of Partogram

- ↓Prolonged labor
- ↓Chances of Obstructed labor
- ↓chances of Uterine rupture
- ↓chances of Sepsis
- ↓PPH

Reduction in MMR is ultimate goal

# LABOR-B

Presentation

- → Part of Fetus in the lower segment is Presentation
- → Cephalic is the MC Presentation
- → Breech is the MC Malpresentation (3.1)

LIE → Relation b/w the vertical axes of both mother and baby

Presenting Part

- Part of Presentation at Internal Os
- Presenting part depends upon Attitude of baby

| Presentation | Engaging Diameter | Mode of delivery |
|---|---|---|
| Vertex<br>(Well Flexed Head) | Suboccipito bregmatic (9.5cm) | Normal |
| Face<br>(Extended Head) | Submento bregmatic (9.5 cm) | Normal |
| Brow<br>(Deflexed Head) | Mentovertical (14 cm) | Cesarean section |

Attitude

- Relation of the fetus to its own body

Denominator

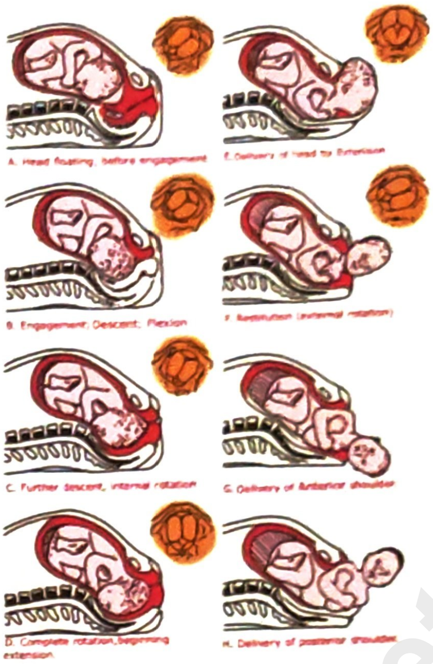
- The lowest bony part of presenting part

Position

- The relation of denominator to the various diameters in the Pelvis

## Cardinal movements of labor

Engagement
↓
Descent
↓
Flexion
↓
Internal rotation
↓
Extension
↓
External rotation
↓
Expulsion of fetus


A. Head floating, before engagement
B. Engagement, Descent, Flexion
C. Further descent, internal rotation
D. Complete rotation, beginning extension
E. Delivery of head by Extension
F. Restitution (external rotation)
G. Delivery of Anterior shoulder
H. Delivery of posterior shoulder

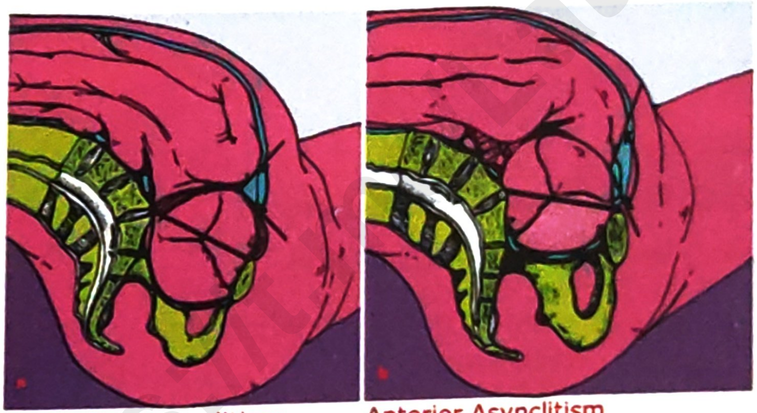
## Asynclitism

### 1. Anterior Asynclitism

- Anterior Parietal bone precedes the sagittal suture
- Seen more in Multigravid

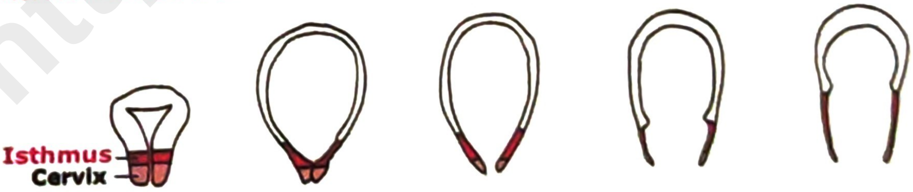
### 2. Posterior Asynclitism

- Posterior Parietal bone precedes the sagittal sutureSeen more in Primigravida (d/t ↑ Abdominal tone)



Posterior Asynclitism Anterior Asynclitism

## Formation of LOWER SEGMENT of Uterus in labor



- Uterus →3.5cm
- Isthmus →0.5cm (Normal Uterus)
- Cervix → 2.5cm
- Area between Anatomical Internal Os And Histological Internal Os is Isthmus
- Lower uterine segment → 10cm at term
- Physiological Retraction ring:
  - Seen in normal labor
  - Felt by P/V examination
- Pathological Retraction ring (Bandl's ring):
  - Seen in Obstructed labor
  - Felt both internally (P/V) as well as externally

## Management

### Presented at the time of labor

Cephalic Presentation → Can be delivered normally

Breech Presentation → Trial of normal delivery in Institutional set up under the guidance of experienced gynecologist

Transverse Lie with shoulder Presentation →Delivered by Cesarean section

### Presented at 36-37 weeks

Cephalic Presentation → Normal delivery

Breech Presentation → Ext. Cephalic Version → Normal Delivery

Shoulder Presentation→ Ext. Cephalic Version → Normal Delivery

### Internal Podalic Version

→ Not done in Transverse Lie (Risk of Uterine Rupture) of singleton pregnancy

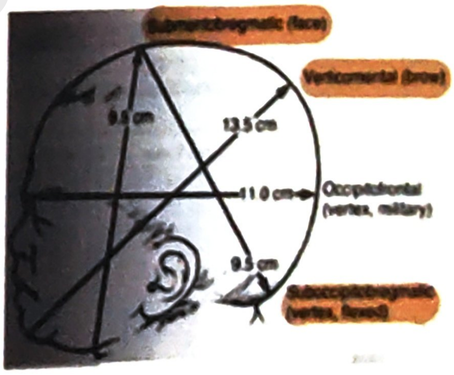
→ Can be done in Transverse Lie of 2nd baby in Twin pregnancy

- Reason → Uterus is relaxed

# LABOR-C

## Fetal Skull

| Diameter | Measurement | Attitude of Head | Presentation |
|---|---|---|---|
| 1. Suboccipito-bregmatic | 9.5cm | Complete flexion | Vertex |
| 2. Suboccipito frontal | 10cm | Incomplete flexion | Vertex |
| 3. Occipito frontal | 11.5cm | Incomplete flexion | Vertex |
| 4. Mento vertical | 14cm | Deflexed head / military position | Brow |
| 5. Submento vertical | 11.5cm | Incomplete extension | Face |
| 6. Submento bregmatic | 9.5cm | Complete extension | Face |


Submentobregmatic (face)
Verticomental (brow)
9.5 cm
13.5 cm
11.0 cm
Occipitofrontal (vertex, military)
9.5 cm
Suboccipitobregmatic (vertex, flexed)

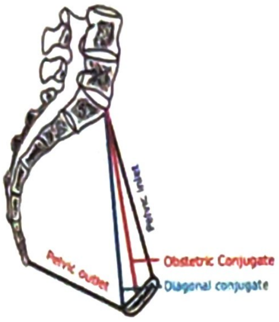
## Female Pelvis

- → 55° Inclined with horizontal
- → Transverse diameter of inlet – distance b/w farthest point on ILIOPECTINEAL line of both

→ Anatomical / True Conjugate → 11 cm (DC-1)

→ Obstetric conjugate → 10 cm (10-10.5cm) (DC-2)

→ Diagonal conjugate → 12 cm



→ Anatomical / True Conjugate → Top of Pubic symphysis to Sacral promontory

→ Obstetric Conjugate → Back of Pubic symphysis to Sacral promontory
- Most important diameter for Engagement of Fetal head

→ Diagonal Conjugate → Bottom of Pubic symphysis to

Bispinous / Interspinous Diameter → 10.5 cm

Distance b/w Ischial tuberosities → 10.5 cm
- ‹ 8 cm → Contracted outlet

Posterior Sagittal Diameter → 7.5 cm

Contracted Inlet / Pelvis → If Obstetrical conjugate is ‹ 10 cm

→ If Interspinous diameter is ‹ 8 cm

→ If the summation of Posterior Sagittal diameter & Interspinous diameter is ‹ 15.5 cm

| Diameters | Contracted Pelvis |
|---|---|
| DIAMETERS OF PELVIC INLET | |
| True conjugate (DC-1) = 11cm | |
| Obstetric conjugate (DC-2) = 10cm | ‹10CM |
| Diagonal conjugate (AP diameter) = 12cm | ‹11.5cm |

| | |
|---|---|
| Trasverse diameter = 13cm | <12cm |
| Oblique diameter = 12cm | |
| DIAMETER OF THE MIDPELVIS | |
| Interspinous diameter = 10.5cm | Suspected contraction <10cm<br>Contracted <8cm |
| AP diameter = 11.5cm | |
| Posterior sagittal diameter = 5cm | |
| Interspinous – posterior sagittal diameter = 15.5cm | <13.5cm |
| DIAMETERS OF THE PELVIC OUTLET | |
| Transverse diameter / Inter Ischial diameter = 10.5cm | <8cm |

* Plane of Maximum Pelvic Dimensions

- From midpoint of posterior Pubic Symphysis to the junction of 2nd & 3rd Sacral Vertebrae

* Plane of Least Pelvic Dimensions

- From lower border of Pubic Symphysis to the tip of Ischial spines to tip of 5th Sacral Vertebrae

*Rachitic Pelvis

- d/t childhood deficiency of Vit. D
- Shape of inlet – Reniform

*Triradiate Pelvis

- d/t Vit. D, calcium deficiency in mature women (Osteomalacia)
  - * One Ala of Sacrum missing – NAEGELE'S Pelvis
  - * Both Ala of Sacrum missing- ROBERT'S Pelvis

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# LABOR-D

## Delivery of Vertex Presentation

### Movements of Fetus in a NVD in Vertex Presentation

*Attitude of Fetus- Flexion

| | |
|---|---|
| * MC presentation | - Cephalic |
| * MC presenting part | - Vertex |
| * Denominator | - Occiput |

Fetus in flexed attitude (Flexion)
↓
Engagement
↓
Descent
↓
Flexion
↓
Internal rotation
↓
Delivery of head by Extension
↓
Restitution
↓
External rotation of head
(occurs as result of internal rotation of shoulders)
↓
Delivery of anterior shoulder
↓
Delivery of posterior shoulder

- MC position of Vertex → LOT (40%) › LOA
- MC malposition of Vertex → ROP (Right Occipito Posterior)

### Occipito Posterior Position Probabilities

1. 80% becomes Occipitoanterior
   → Mode of delivery → Normal
2. 15-16% becomes persistent Occipitoposterior
   → Occurs in Anthropoid Pelvis
   → Mode of delivery → Face to Pubis delivery

3. 2-4% undergoes deep transverse arrest
   → Occurs in Android Pelvis

→ Mode of delivery → Manual rotation and Forceps extraction (Sagittal suture of baby should be in AP plane of Pelvis)

OR

→ Cesarean section

### Brow Presentation

→ Diameter of engagement → Mentovertical

→ Mode of delivery → Cesarean section

### Face Presentation

→ Generally seen in Platypelloid Pelvis

### Lt. Mento Anterior Position

→ MC position of face presentation

→ Diameter of Engagement → Submento bregmatic (9.5 cm)

→ Delivery occurs with flexion

* Face Presentation delivers provided Mentum is anterior

### Direct Mento Posterior

→ Rotates posteriorly (unfavourable rotation)

→ Diameter of Engagement → Sternobregmatic (17.5 cm)

→ Mode of delivery → Cesarean section

### Mento Posterior

→ Becomes mento anterior by rotating 3/8th of the circle (favourable rotation)

→ Mode of delivery → Normal delivery with flexion

| PART | POSITION | ENGAGING DIAMETER | MECHANISM OF LABOUR |
|---|---|---|---|
| VERTEX (Flexed) | OCCIPITO-ANTERIOR | Sub-occipitobregmatic (9.5 cm) | Vaginal delivery (head born by extension) |
| | OCCIPITO-POSTERIOR | Sub-occipitofrontal (10cm) or Occipitofrontal(11.5 cm) | Anterior 3/8 rotation→ OA→ vaginal delivery<br>Anterior 1/8 rotation→ OT→ manual rotation-forceps ext LSCS<br>Posterior 1/8 rotation→DOP→face to pubis delivery |
| BROW (deflected) | | Mentovertical(14cm) | No mechanism→LSCS |
| FACE (extended) | MENTO-ANTERIOR | Submentobregmatic(9.5 cm) | Vaginal delivery (head born by flexion) |
| | MENTO-POSTERIOR | Sterno-bregmatic | Anterior 3/8 rotation→ MA→ Vaginal delivery<br>Anterior 1/8 rotation→ MT→LSCS<br>Posterior 1/8 rotation→MP→ LSCS |

### Breech Presentation

Breech presentation is a/w:

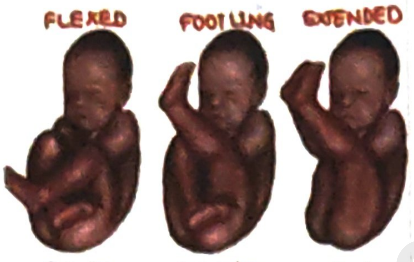
- Prematurity (MC)

- Twins
- Polyhydramnios
- Anomalies
  - Mother – Bicornuate Uterus, Unicornuate Uterus
  - Baby – Hydrocephalus
- Placenta previa
- Pelvic tumors

## Breech Delivery

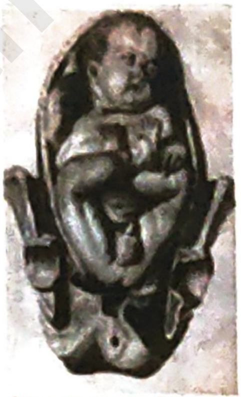
### Variations in Breech Presentation

→ Complete Breech (Flexed)
→ Incomplete Breech (Footing)
→ Frank Breech (Extended)



MC breech } Frank Breech
Best breech for Vaginal delivery } Frank Breech

→ Complete breech can be delivered vaginally
→ Footling Breech can't be delivered Vaginal & is delivered by Cesarean section
→ Breech with Extended head
  → Star Gazing Sign on USG
  → Indication of Cesarean section



## Breech Vaginal Delivery

→ Always prefer the breech in anterior position
→ Take Consent of mother before planning Breech vaginal delivery
→ Give Epidural analgesia
- Relaxes Pelvic muscles
- Gives anaesthesia to Pelvic floor & skin in Perineum

1. Breech Extraction
2. Spontaneous Breech Delivery

} Done only for dead babies

3. Assisted Breech Vaginal Delivery

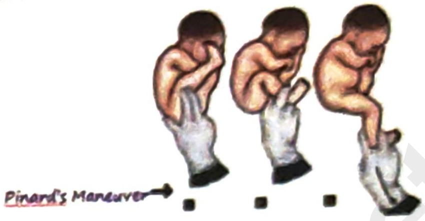
→ No touch till Umbilicus is delivered

- → For extended legs → Do Pinard's Maneuver
- → For Extended arms → Do Loveset's Maneuver
- → Delivery of after coming head
  - a. Piper's Forceps
  - b. Mariceau - Smellie - Viet Maneuver
  - c. Burns - Marshall Maneuver

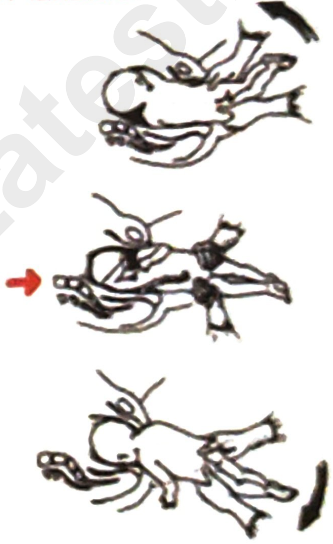
## Left Sacro Anterior Position

- → MC position of breech presentation
- → Attitude - Flexion

(Flexed Breech)

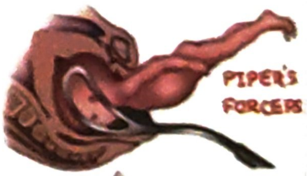


  - Always keep the Back anterior
  - Legs comes out first
- → Attitude - Extension (Extended Breech)
  - Buttocks comes out first
  - Deliver the extended legs by Pinard's Maneuver



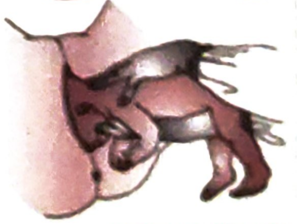
- → Hold the baby at Pelvic bone and pull the baby down
- → Flexed Upper limbs
  - Hold the upper limb from Cubital fossa & pull it down
- → Extended Upper Limbs -Delivered by LOVESET'S MANEUVER
  - Pull The Baby as low as Possible
  - Rotate the baby to one side
  - Hold the arm and pull it out from posterior roomy vagina

## After coming Head Delivery by



1. Piper's Forceps (Safest method)
2. Mariceau - Smellie - Viet Maneuver

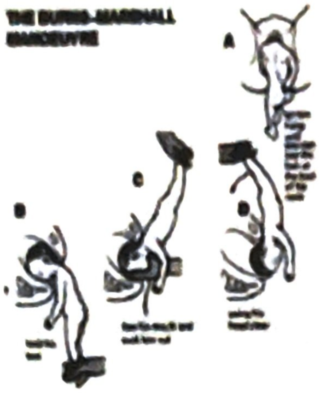
- → One hand
  - One finger on back of the head for flexion
  - Two fingers on shoulders for traction


MSV MANEUVER

→ Other hand

- Two fingers on Malar bones or one finger on Jaw for Flexion

  Do Malar flexion and Shoulder traction



3. Burns - Marshall Maneuver
   - Let hang the baby till the nape of neck is visible
   - Hold the feet
   - Swing the baby head upwards (in a circle of arc) and the head pops out with flexion

Complications of Breech Delivery: C-Section Vs Vaginal

| Maternal | Fetal |
|---|---|
| • Genital Tract Injuries<br>- C. Section<br>○ Extension of scar laterally or need of inverted T incision<br>- Vaginal Delivery<br>○ Cervical, Vaginal lacerations<br>○ Uterine Rupture<br>○ Perineal tears<br>○ Extension of episiotomy<br>○ Infections<br>• Post partum Hemorrhage<br>• Cord prolapse | - Fracture of Humerus, Clavicle, Femur (More with vaginal)<br>- Brachial Plexus Injury<br>- Spinal cord injury<br>- Vertebral fracture<br>- Sternocleidomastoid hematoma (Rt. > Lt.) (Pseudotumor of SCM) (Fibromatosis Colli)<br>- Fetal genital tract injuries<br>- Inherent to breech (CS or Vaginal) : Hip Dysplasia |

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# LABOR-E

## Forceps & Vacuum:

1. Common Indications

- Fetal distress
- To shorten second stage of labor
  - Cardiac disease
  - Hypertensive crisis
  - Spinal cord injury
  - Prolonged second stage
  - Maternal exhaustion
  - Epidural analgesia

2. Common pre-requisites

- Adequate Pelvis
- Consent
- Empty bladder
- Good contractions
- Station +2 or lower
  - Head <1/5th palpable per abdomen
- Membranes ruptured
- Adequate anaesthesia
- Facility of emergency LSCS available

### Forceps Delivery

→ Forceps can be applied when head is fully rotated → The sagittal suture of the head lies in antero-posterior axis of Pelvis.

→ Forceps can also be applied even if the rotation of head is partial [$\leq 45°$]

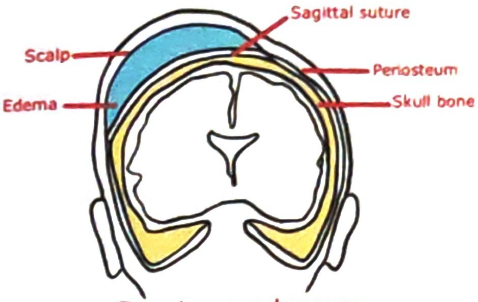
| Forceps | Vaccum |
|---|---|
| Applied on | Applied on |
| → Fully rotated head or <45° remaining<br>- Vertex<br>- After coming head of breech<br>- Mento-anterior face<br>→ Fully dilated Cervix<br>→ Station → +2 & below<br>→ Can be used in preterm<br>→ Can be used in presence of Caput | → Rotated head or Non rotated head<br>- Used for Cephalic presentation only<br>- Not used for breech or face<br>→ >6 cm dilated Cervix<br>→ Station → +2 & below<br>→ Cannot be used for preterm fetus / fetal coagulopathy<br>→ Cannot be used in presence of Caput |

Complications

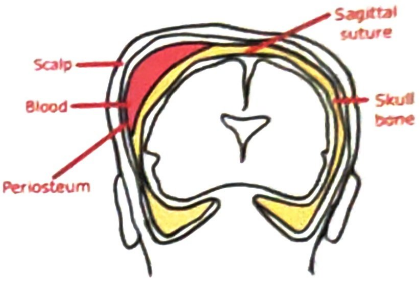
| Forceps | Vacuum |
|---|---|
| Maternal > Fetal | Fetal > Maternal |
| Maternal complications | |
| • Genital tract lacerations | • Genital tract lacerations & tears |
| Fetal complications | |
| • Cephalhematoma<br>• Bruising, lacerations<br>• Facial Nerve injury, Brachial plexus injury | • Scalp injury, Cephalhematoma<br>• Intracranial hemorrhage<br>• Retinal hemorrhage |

| CAPUT SUCCADENEUM | CEPHALHEMATOMA |
|---|---|
| • Soft tissue edema<br>• Ill-defined borders<br>• Dependent head at labor<br>• Extends across suture lines<br>• Present at birth<br>• Does not increase in size<br>• Disappears over 48 hrs<br>• Complications are rare | • Blood subperiosteal Hemorrhage<br>• Limited by suture lines<br>• Seen few hours after birth<br>• Gradually increases in size<br>• Resolves in few weeks |

Complications
- Skull fracture
- Coagulations defects
- Intracranial bleeding
- Jaundice



Caput succadeneum



Cephalhematoma

## INDUCTION OF LABOR (IOL)

- Induce contractions before spontaneous onset of labor

### Augmentation of labor

- Labor requires enhancement because the contractions are inadequate

### Indications for IOL

- The risk of induction of labor are lesser than those on mother / fetus with continuation of pregnancy

1. PROM
2. Severe gestational HTN
3. Oligohydramnios
4. Non-reassuring Fetal Heart pattern
5. Post term pregnancy
6. Gestational DM, Overt DM, Chronic HTN

## BISHOP SCORE

- Used to assess Cervix and station of Fetal head before inducing labor

| Score | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| Dilatation | Closed | 1-2 | 3-4 | 5 |
| Length (Effacement) | >4 | 3-4 | 1-2 | 0 |
| Consistency | Firm | Medium | Soft | -- |
| Position | Posterior | Midline | Anterior | -- |
| Head : Station | -3 | -2 | -1,0 | +1,+2 |

Good score → ≥9

Unfavorable score → ≤4

*Main parameters of Bishop score

- Dilatation of Cervix
- Length of Cervix
- Station of Head

These parameters give enough information to take decisions and also tell whether findings are favorable or not

### Methods of induction of labor

#### Medical methods (Drugs)

1. Oxytocin

- Start with 6 mIU/min

↓

Results are better at this dose when Cervix is already ripe (Good Bishop score)

- If Bishop score is not good → we can ripen the Cervix with Prostaglandins
- >20 mIU/min Oxytocin (High dose)

↓

ADH action of Oxytocin

↓

Water intoxication

↓

Convulsions, Death of Mother

2. Misoprostal ($PGE_1$) (Off label use)
- Dose = 25μg vaginally or 100μg orally
- Avoid $PGE_1$ in previous C-section as it causes vigorous contractions

3. Dinoprostone ($PGE_2$)
- Dose = 0.5mg gel (Cerviprime) → Applied Intra-Cervical

Or

- 20mg Suppository → given per rectum

Or

- 10mg 'Insert'
  - Ideally taken out after 12hrs / after labor starts whichever is earlier
  - Pull the 'Insert' out if there is Tachysystole

* Tachysystole → >5 Uterine contractions / 10mins

4. Mifepristone 200mg tablet
- Anti-progestin & Anti-corticosteriod action
- Also used for Cervical ripening & Induction of labor
- Dose = 200mg / day x 2days

Surgical methods

1. Stripping of membranes

↓

Releases endogenous PG

↓

Causes IOL

2. Artificial rupture of membranes (using KOCKEAS forceps)

↓

Causes IOL / Augmentation of labor

- Artificial rupture of membranes
  - Early Amniotomy → 1-2cm
  - Late Amniotomy → 5cm or later
- Indications of ARM
  - Post term pregnancy
  - Past dates

- Fetal anomalies
  - DM at term
  - Abruptio placentae
- Contra indications of ARM
  - C.P.D. (Cephalo Pelvic Disproportion)
  - Contracted Pelvis
  - Previous Classical C-section
  - Pelvic Tumors
  - Active genital Herpes
  - Ca Cervix

### Mechanical methods

1. Intra Cervical Foley's Catheter
   - Bulb of Foley's is distended with 30ml of fluid
2. Laminaria tents
   - Dry sea weeds

↓

Hygroscopic action

↓

Imbibe fluids & swell up (in 10-12 hrs) and open up Cervix

### Risks of IOL

- ↑ C-section
- Chorio-amnionitis
- Uterine rupture
- PPH (may require Emergency Obstetric Hysterectomy)

## Chapter 26

# EPISIOTOMY

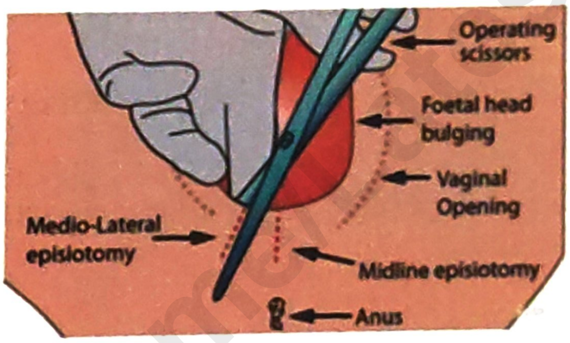
### INDICATIONS

00:01:11

- Breech
- Instrumentation
- Large Baby
- Persistent Occipito posterior
- Shoulder dystocia

### COMPLICATIONS

- Rectal Incontinence
  - Flatal Incontinence
  - Faecal incontinence



### TYPES

00:02:45

- Median
- Lateral (mostly avoided) → As they can cut ducts of Bartholin's gland
- Medio-lateral

### STRUCTURES RESECTED

- Skin
- Sub cutaneous tissues
- Superficial and Deep Transverse Perineal muscles

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- Muscles fibres of Bulbospongiosus, levator ani
- Transverse perineal branches of Pudendal nerve & vessels
- Posterior Vaginal wall

| Features | Midline/Median Episiotomy | Medio Lateral Episiotomy |
|---|---|---|
| Repair | Much easier | Easier |
| Healing | Faster & Better | Late |
| Blood Loss | Minimal | More |
| Scar wound | Even | Uneven |
| Dyspareunia | Rare | Occasionally present |
| POST OP Pain | Lesser | More |
| Wound Extension | More Common | Less Common |

For more notes visit

Or click this page to visit the channel

# Chapter 27

# Puerperium

- → Time immediately after delivery extending upto 4-6 wks.
- → It is time required for body to get into normal shape and size
- → Woman is still in Immuno compromised state

| Changes during Normal Puerperium 00:01:31 | Changes in Abnormal Puerperium |
|---|---|
| → Reproductive Organ Changes<br>→ Systemic Changes | → Endometritis<br>→ Wound infections<br>→ Mastitis<br>→ Deep venous Thrombosis<br>→ Thrombophlebitis |

## Reproductive Organ Changes

00:02:28

### Uterus

→ 1000 gms of Uterus returns to 100 to 200 gms

→ Size

- Immediately after delivery → Just below the Umbilicus
- Best time to do Puerperial sterilization → 2-3 days
- Maximum time to do Puerperial sterilization → 7-10 Days
- Uterus becomes a pelvic organ by → 10-14 Days
- Uterus becomes a normal organ in → 4-6 wks

### Cervix

→ Becomes firm

→ Epithelium starts to regrow

→ Transformation zone starts to reform (more suseptible to Ca Cervix)

→ Cervix closes by 3 weeks

### Vagina

→ Starts shrinking

→ Rugae starts to reform from 2nd to 3rd week onwards

→ Epithelium starts to grow by 6th week (4 - 6 weeks)

### Breast

→ Sudden drop of Hormones (Estrogen)

→ Increased action of Prolactin - Lactogenesis

→ Colostrum

- Produced in 1st 2-3 days
- Rich in IgA & IgG, Proteins, Fats

→ After 3 days, milk production starts to increase

→ If the women doesn't breast feed, Breast will be in normal shape & size in 3 weeks

### Lochia

Lochia Rubra →1st to 4th day, RED (mostly blood)

Lochia Serosa→ 5th to 9th day, YELLOW (mostly Mucus, some RBC)

Lochia Alba →10th to 14th day, WHITE (mostly Epithelial cells)

### Abnormal changes

### Puerperal Fever 00:10:30

→ Any fever in 1st 10 days after delivery

→ Temp →>38°C (100.4°F)

→ MC Cause → Endometritis

### Endometritis 00:11:04

### Causes

→ Enteric bacteria (mc)

→ Local commensals

→ Group A β Hemolytic Streptococci (mc)

- → E. Coli, Klebsiella (Gram -ve)
- → Chlamydia (MC cause of late Endometritis)

### Clinical features

#### Symptoms

- → Fever
- → Pain abdomen
- → Dirty, foul smelling discharge
- → Fatigue, weakness

#### Signs

- → Lower abdomen tenderness
- → On P/V examination
  - Uterine & Adnexal tenderness
  - Fullness in Pouch of Douglas (d/t Blood collection / Abscess)

### Investigations

- → ↑ leucocytes on CBC
- → ↑ ESR, ↑ CRP

### Treatment

- → Clindamycin + Gentamycin (Gold standard of therapy for Endometritis)
  - 90-97%) success rate

00:14:47

### Mastitis

- → MC cause → Staphylococcus aureus

### Clinical features

- → Engorged breast
- → Tender breast
- → Fluctuant mass present

### Treatment

→ Avoid to Breast feed from affected Breast if baby refuse to suck the swollen Nipple

→ Apply moist heat
  - Gives soothing sensation to Breast
  - Removes congestion from Breast

→ Oxytocin
  - Used to express Breast milk

→ Analgesics

→ Antibiotics
  - Cephalosporins
  - Penicillins (Penicillinase resistant Penicillins)

### Urinary Tract Infection

00:17:25

→ MC cause → E. Coli

→ Culture sensitivity should be done

### Management

→ Cephalosporins

→ Pencillins

→ Nitrofurantoin

### Deep Venous Thrombosis

→ Accompanies the Endometritis

### Clinical Features

→ Pain
  - In abdomen or in Limbs
  - Radiating to thigh (if Thrombus is in Pelvic veins)

→ ↑ Pulse Rate

→ Fever

### Investigations

→ ↑ WBC

- → ↑ ESR
- → ↑ CRP
- → Do CT Scan/MRI → to localise the Thrombus
- → MC cause – Thrombus in deep Pelvic veins

### Treatment

- → Strict Bed rest
- → Limited Physiotherapy
- → IV antibiotics (Clindamycin + Gentamycin)
- → Heparin 5000 IU - 10000 IU OD / BID
  - INR should be > 2

### Endocrine Disorders

00:20:24

- → Post partum Thyroiditis
- → Graves disease
- → Sheehan syndrome (Post Partum Pituitary Necrosis)

### Postpartum Thyroiditis

- → Acute Destructive Lympocytic Thyroiditis
- → Hyperthyroidism
  - In first 1-4 months
  - Rx with Propranolol
- → Hypothyroidism
  - In later 4-8 months
  - Rx with Thyroxine supplementation

### Sub Involution

00:22:35

- → Normal rate of reduction of size of Uterus → 1-2 cm/ day

### Causes

- → Retained bits of Placenta & Membranes
- → Infection
- → Blood clots
- → Fibroids

### Clinical features

→ Boggy or flabby Uterus

→ Palpable beyond 10 days per abdomen

→ Tender Uterus

→ Fever is present

### Treatment

→ Empty the Uterus by Gentle curettage after doing USG

→ IV Antibodics

→ Methyl Ergometrine Tablets

- 0.2 mg TID X 5-7 Days

## Psychiatric Disorders

00:24:57

### Blues

- Occur within first few days and resolve by 2 weeks (50-60%)
- Due to sudden loss of Progesterone
- Characterized by mild mood swings, irritability, anxiety, decreased concentration, insomnia, tearfulness, crying spells in 85% of women for a short time in the immediate Postpartum period

### Depression

- Occurs in first 3-6 months (10-15%)
- Insomnia, anxiety, low self worth, unable to care for and bond with baby

### Psychosis

- Within first 2-3 months (<1%)
- Severe insomnia, rapid mood swings, anxiety, psychomotor restlessness, delusions and hallucinations

*Post Partum Hemorrhage is also the part of Abnormal Puerperium.

## Chapter 28

# Cesarean Section

- Good rate of CS in any hospital → 18-25% overall
- Most institute CS rate → 30-35% is acceptable

### Reasons for increased incidence of CS 00:03:50

→ No. of children reducing
→ ↑ age at pregnancy
→ More use of electronic Fetal monitoring
→ ↓ trial in previous CS & breech
→ CDMR [Cesarean delivery on maternal request]

### Indications of CS (MC indication – Fetal distress)

### Maternal Indications 00:07:17

→ Previous CS
→ Abnormal placentation
→ Classical CS
→ Scar dehiscence
→ Full thickness Myomectomy
→ Genital tract Obstructive mass
→ Invasive Cervical cancer
→ Prior Trachelectomy
→ Permanent cerclage
→ Reconstructive Surgeries
→ Pelvic deformities
→ HSV or HIV Infection (only when Viral load is high)
→ Cardiac & pulmonary disorders
→ Cerebral aneurysm
→ Perimortem CS

### Maternal - Fetal Indications 00:12:37

→ Cephalopelvic Disproportion
→ Failed Operative Vaginal delivery
→ Placenta Previa
→ Abruption with fetal distress

## Fetal Indications 00:13:47

- → Non-assuring fetal heart pattern / Fetal distress
- → Mal-presentation
- → Congenital anomalies
- → Abnormal Doppler studies (REDF – Reverse End Diastolic Flow)
- → Prior Fetal birth trauma

## Mortality rate in Cesarean Section 00:15:07

→ Mortality rate 7 / 1,00,000 as compared to normal delivery [3-4 / 1,00,000]

## Advantages for Mother 00:16:10

- Much less incidence of Prolapse
- Much less incidence of Urinary incontinence

## Advantages to Baby

- ↓ Neonatal Morbidity [≤1%]
- ↓ Skin lacerations (MC problem)
- ↓ Cephalohematoma
- ↓ Skull & clavicle fracture
- ↓ Brachial plexopathy
- ↓ Facial nerve injury

*Failed Forceps f/b C-section is most problematic for Neonate

## Procedure of C-section

1. Consent
2. Antacid 30 ml → to prevent MENDELSON SYNDROME (Aspiration Pneumonitis)
3. Regional anesthesia (Neuraxial)
4. Sensory block should be at T4 level and below (Epidural anesthesia in normal delivery should be at T10 to L1 & S2-S4)
5. Best position → Supine with wedge under the right hip
6. Prophylactic Antibiotics → Cephalosporin (Cefazoline 1gm once) (No routine Antibiotics, no routine Catheterization)
7. Preparation of Abdomen

→ Shaving is not done

→ Clipping of pubic hair can be done

8. Check the Fetal heart sound prior to incision in OT
9. Decision to delivery should not be more than 30 minutes

## Technique of C-section

00:29:42

### Abdominal Incision

→ Easy & fast incision → Vertical

→ Preferred incision → Transverse / Bikini incision / Pfannenstiel incision / Maylards incision

### Advantage of Transverse incision - Cosmetically better

* Pfannenstiel incision – Rectus sheath not cut, only separated

*Maylards incision - Rectus sheath cut

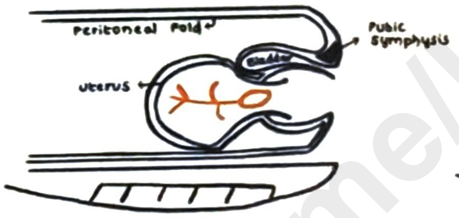
## Side effects of Lower Abdominal Incision

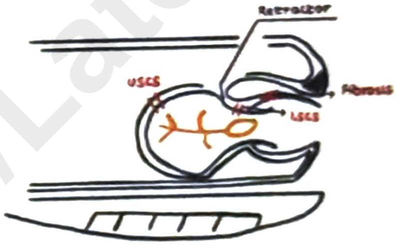
00:32:36

→ Ilioinguinal nerve injury

→ Iliohypogastric nerve injury

→ Superior & inferior epigastic vessel injury





### Classical CS: Upper Segment CS Indications

1. Bladder Fibrosis (MC indication)
2. Lower segment tumor like fibroid, Ca Cervix
3. Post Mortem CS
4. Old VVF repair

00:39:57

| LSCS | Classical CS |
|---|---|
| Easy to repair | Difficult to repair |
| Less bleeding | More bleeding |
| Heals faster | Slow healing |

- Passive lower segment (retracts in labor)
- Trial of labor is possible in next pregnancy (VBAC) (for 1 previous LSCS only)
- Rupture rate → 0.5 - 2%

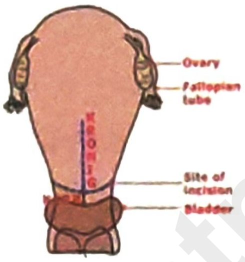
- Trial of NVD is C/I due to risk of rupture of Uterus
- Rupture rate → 8-10%

Incision on Uterus

00:44:20

Lower segment Incisions

1. Kerr's Incision
→ Transverse Incision
→ MC Incision on Uterus
2. Kronig Incision → Vertical Incision



CS Complications

00:50:08

→ Hemorrhage
→ Sepsis, Peritonitis
→ Endometriosis
→ Thromboembolism
→ Anaesthesia complications
→ Visceral Injuries
→ Fetal Injuries
→ Hysterectomy

Late Complications
→ Incisional Hernia
→ Seroma formation
→ Scar rupture
→ Wound break down
→ Infertility

Previous LSCS scenario, Trial of Scar performed – VBAC / TOLAC

→ VBAC [Vaginal Birth after Cesarean]

→ TOLAC [Trial of labor after Cesarean]

→ It should be done in an Institutional set up

→ There should be no CPD

→ Previous 1 LSCS

→ Rupture of Uterus can happen

00:54:48

- Partial (Scar Dehiscence)
- Total

*Scar Dehiscence- Uterine Scar is separated but Peritoneum & bag of membranes is intact

### *Total Rupture of Uterus

- Uterine Scar, Peritoneum & bag of membranes all have ruptured
- Baby may be found floating in abdomen

### → Signs of Rupture of Uterus in a VBAC/TOLAC 00:56:28

- Maternal Tachycardia ($1^{st}$ sign)
- Vaginal bleeding, ↓ ↓ BP
- Fetal distress (Late sign)
- Loss of Uterine contractions & labor pains
- Loss of Uterine contour
- Fetal parts felt more superficial in abdomen & they might be in sideways & not in midline

## Chapter 29

# SPECIAL SITUATIONS IN OBSTETRICS

### UMBLICAL CORD PROLAPSE 00:00:34

- Incidence <1% of all pregnancies
- Can be a cause of FETAL MOBIDITY & MORTALITY

### WAYS IN WHICH CORD CAN PRESENT 00:02:32

- OVERT / OBVIOUS cord prolapse
- OCCULT on the side of presenting part
- CORD PRESENTATION (FUNIC)

### Etiology

Associated mostly with non cephalic presentation

- Breech
- Transverse lie
- Oblique
- Unstable lie

### Prevention 00:03:32

- After admission > 37 weeks
- Avoid A.R.M
  - Funic presentation
  - High presenting part
  - Non-fixed presenting part

### Management 00:06:19

- Call for help!!

- Prepare for immediate delivery in O.T. → C.S.
  (If fully dialated Cervix → Forceps delivery)
- Don't touch the cord }
  Vasospasm
- Don't push the cord }

→ Push the presenting part upwards

→ Knee chest position or left lateral position

→ Fill the bladder to push up the presenting part

→ Tocolysis (can be done)

## SHOULDER DYSTOCIA 00:11:47

- Anything that comes in the way of delivery → Dystocia
- Incidence: 1% of all deliveries
- A/w:
  - Large babies >4Kgs
  - Post term pregnancy
  - Diabetic mothers
  - Anencephaly → large baby

  There can be: Neonatal Morbidity & Mortality

- After the head delivery, rest of the body should deliver within 20-25 seconds

↓

If taking >60seconds

↓

Dystocia

## Complications 00:16:25

→ ERB's paralysis : $C_5 - C_6$

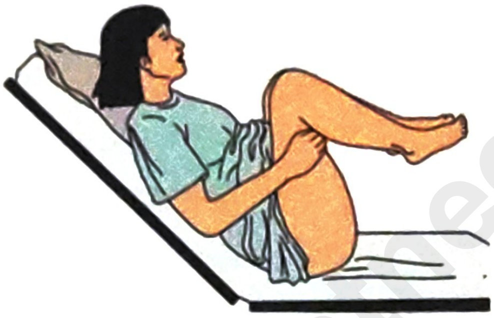
→ KLUMPKE's Paralysis : $C_8 - T_{11}$

## Management 00:17:10

→ Call for help!!

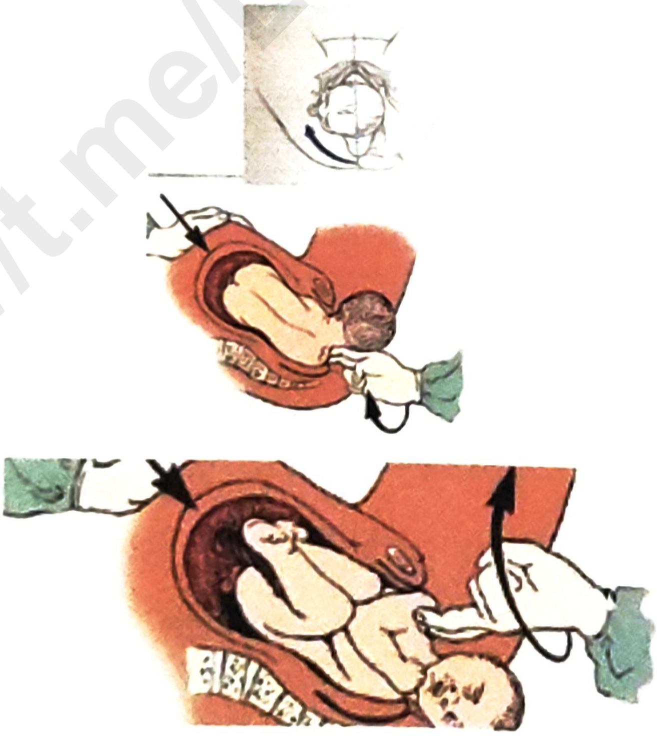
→ Suprapubic pressure → Rubin maneuver (1st)

→ Mc Roberts : >90°, Hyperflexion & Abduction of hip Joint



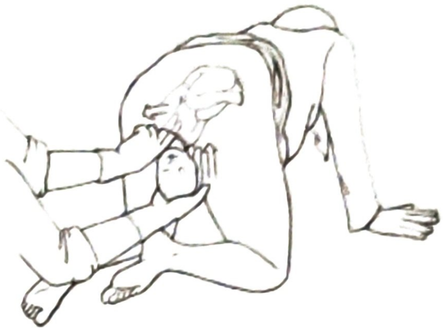
MC ROBERTS MANEUVER

→ Wood's 'Cork Screw' maneuver



CORK SCREW MANEUVER

→ Gaskins 'ALL FOUR' maneuver



GASKINS MANEUVER

→ Zavanelli's Restituion (70% babies are lost by this time)

## PRECIPITATE LABOUR 00:26:43

- From onset of contractions to delivery of baby if <3hrs
- Incidence upto 3% of all deliveries
- A/w : PIH / HTN
  Abruption

Reason: 00:28:05

- Very less resistance from soft pelvic parts
- Very strong uterine & abdomen contractions
- Less pain perception

Results: 00:2:20

- Vaginal, vulval & cervical lacerations
  ↓
- Amniotic fluid Embolism
  ↓
- Uterine atony →PPH

Prevent: 00:30:52

- Tocolysis
- Inhalational anaesthetics
- Stopping the oxytocin infusion

## AMNIOTIC FLUID EMBOLISM 00:31:56

- Incidence : 5-10/ 100,000
- Anaphalactoid Reaction
  - AF→Tissue factor→Cagulation cascade
  - Fetal squares→Endothelin-1
  - Amniotic →Phosphatidyl serine

## CHAIN OF EVENTS 00:33:15

### Phase 1

- Systemic & Pulmonary HTN

↓

- Large dilated Rt. Ventricle, Akinetic
- Vigorously contracting left ventricle, small–cavity obliterated

↓

- Loss of systemic vascular resistance

↓

- Cardiovascular collapse

**Phase 2:** Consumptive Coagulopathy-DIC

**Phase 3:** Multi organ Dysfunction

(Lungs / Brain / Renal / Hepatic injuries)

→Within 30 min. >50% women die

↓

Of the few survivors,
75% life - long neurological deficit

## OBSTRUCTED LABOR 00:38:03

Definition: No progress of labor inspite of good Uterine contractions (i.e. there is no descent of the Presenting Part)

### Causes

- Neglected Cephalopelvic disproportion (MC)
  - Large baby
  - Contracted Pelvis

- Malpresentation
  - Transverse Lie with shoulder presentation
  - Neglected Brow presentation

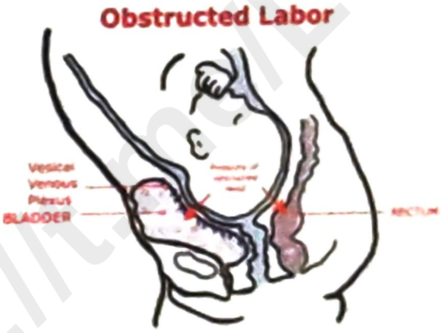
- Malpositions
  - Occipito-posterior

Signs

- Hematuria
  - Presents early
  - Due to pressure of Fetal head on Bladder which results in damage of Vesical venous plexus
- Vesico Vaginal Fistula (VVF) } Late presentation
- Injury to posterior part of Vagina } Late presentation
  →Rectal tear

* In case of ischemic injury to Vagina & Bladder
  - 5-7 days later, Vesico Vaginal Fistula presents
  - VVF is prevented by Urinary catheterization for 14-21 days

Obstructed Labor



Management

- Mx of Obstructed labor →C-section
- Obstructed labor with dead baby →C-section

Maternal Complications

- Rupture of Membranes

  ↓

  Chorioamnionitis

  ↓

  Puerperal Sepsis

  ↓

  Shock

  ↓

  Death

- Ruptured Uterus → Shock → Death
- Bladder & Rectal Injuries
  - Stress Urinary incontinence
  - VVF
  - Rectovaginal fistula

Fetal Complications

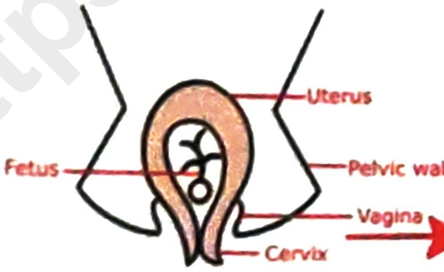
- Still birth (Born Dead)
- Hypoxic Brain damage
- Neonatal Death

## PROLAPSE IN PREGNANCY

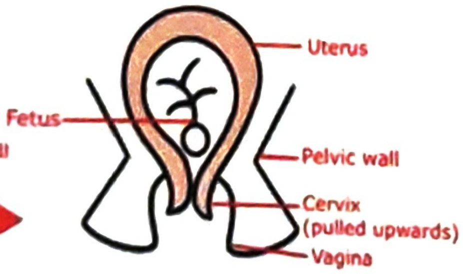
00:47:22

1. Prolapse before pregnancy

- Becomes better/ reduces by end of 2nd Trimester



Prolapse before pregnancy



Prolapse become better/reduces by end of 2nd Trimester

2. Prolapse happening first time in pregnancy

↓

Presents in 3rd trimester

| | Antenatal | Intranatal | Postnatal |
|---|---|---|---|
| Complications | • Spontaneous Abortion<br>• Preterm labor<br>• CervicalTrauma<br>• Lacerations.<br>• UTI<br>• Retention of urine | • Cervical Dystocia (Inadequate Cervix Dilatation)<br>• Cervical lacerations<br>• Obstructed labor<br>Uterine Rupture | • Puerperal Sepsis<br>• Chronic Cervicitis<br>• Subfertility |
| Management | • Bed Rest<br>• Trendelenberg Position | • A/G packing reduces edema & helps in Dilatation | • Antibiotics<br>• Avoid weights |
| | • Local Antiseptics to maintain hygiene (A/G Packs) | • Manual Stretching & pushing up of Cervix | • Reduce workload |
| | • Pessary Continuously | • Duhrssen's incision (2 & 10 O' clock)<br>• Avoid Fundal Pressure | • Corrective surgery |

SPONTANEOUS ABORTION

- Mechanism → Edematous Cervix

↓

Compression from the sides

↓

Venous return reduces

↓

Edema worsens

↓

Arterial supply to lower portion of Uterus also decreases

↓

Ischemia to Uterus

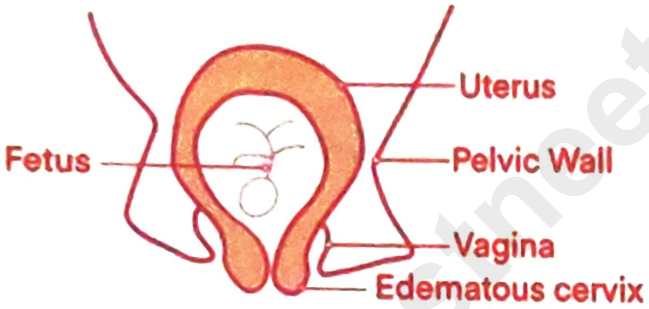
↓

Fetal death

↓

Abortion

- Trendelenberg position →Head Low position →reduces edema
- Bed rest →Reduces edema
- A/G packs
  - Acriflavin →Local Antiseptic
  - Glycerine →Hygroscopic Agent →Reduces edema

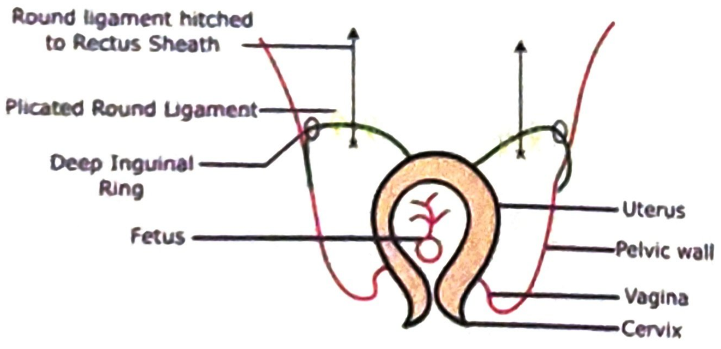


- Pessary to be kept in Antenatal Prolapse
  - The largest pessary which can be comfortably kept without pain & which does not allow the uterus to come out

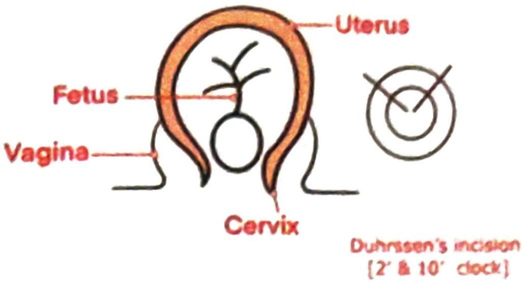
- Modified Gillian Sx →Pulling up the Uterus inside by

a) Plicating Round Ligaments

b) Hitch the Round Ligaments to Rectus sheath



- Duhrssen's Incision



# GYNAECOLOGY

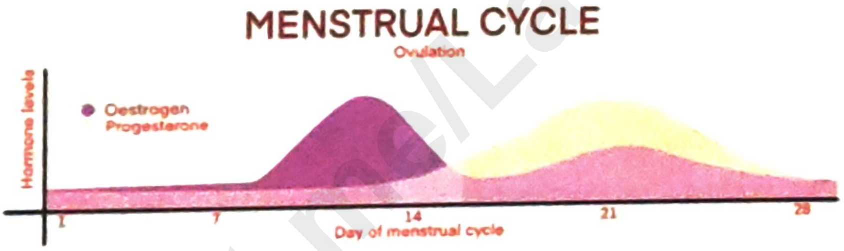
# Chapter 1

# MENSTRUATION, MENOPAUSE, CONCEPTION, CONTRACEPTION, INFERTILITY

## PRIMORDIAL FOLLICLES

00:00:17

- 6-7 millions at 20 weeks of IU Life
- 1-2 millions at birth
- 3-4 lakhs at puberty
- 400-450 utilized



MENSTRUAL CYCLE

## CASE 1

### WOMEN IN WHOM FERTILIZATION OCCURS

- Fimbria Ovarica – Extra long fimbria which takes up oocyte
- Life of oocyte - 24 hrs to 48 hrs (best answer 24 hrs)
- Sperms fertilize oocyte in ampulla
- Embryo reaches the uterine cavity on 3rd to 4th day of ovulation
- IMPLANTATION WINDOW
  - Implantation on secretary or ripened endometrium on 6th to 9th day or 20th to 24th day of the menstrual cycle.

- Progesterone is responsible for secretory endometrium
  Source → Corpus luteum (Follicle)
- Estrogen is responsible for proliferatory endometrium
  source → follicle

## CASE 2

WOMEN IN WHOM FERTILIZATION DOES NOT TAKES PLACE/ 17 YR WOMEN NOT HAVING SEXUAL INTERCOURSE

CORPUS LUTEUM

- Start to degenerates (max function) at → 9th to 10th day
- Complete degeneration at 14th to 15th day → Shedding of endometrium
- Progesterone withdrawal is responsible for shedding of endometrium
- Length of Cervix → 3.5 to 4cm
- Short Cervix → ≤ 2.5 cm

## MITTLESHMERZ/ MID CYCLE PAIN

- d/t blood & debris (from follicle) collected into Pouch Of Douglas at the time of ovulation

## DYSMENORRHEA (Pain of Menstruation)

00:09:54

- During ovulation

↓

Prostaglandins are released
(d/t rupture of oocyte)

↓

Causes contractions of uterine muscle to allow cervix to open for passage of shedded endometrium
(by action of PG's from CL)

↓

These contractions causes pain

## CASE 3

00:18:00

### ANOVULATORY CYCLES

- No MITTLESHMERZ/ mid cycle pain
- Irregular (d/t intermittent recoil of uterus)
- Painless (d/t no/less prostaglandins)
- OVULATORY CYCLES ARE REGULAR & PAINFUL

## DYSMENORRHEA

### TYPES

00:25:17

### PRIMARY/SPASMODIC DYSMENORRHEA

- Pain starts 30 min before onset of periods and stays 10 hrs post onset
- Seen in normal women, women with fibroids

### CONGESTIVE / SECONDARY DYSMENORRHEA

- Pain starts 3-4 days prior and stays throughout menses
- seen in PID & endometriosis

### MEMBRANOUS DYSMENORRHEA

- Fibrinolytic system in uterus is responsible for less/ non clumping of blood
- Total absence of fibrinolytic system
  - Endometrium shed like CAST OF ENDOMETRIAL CAVITY (due to clumping of blood)

    ↓

    More contractions

    ↓

    More pain

## TREATMENT

1. NSAIDS
   - IBUPROFIN
   - NAPROXEN
   - MEFENAMIC ACID

2. Anti Spasmodics
- DICYCLOMIN
- DROTAVARINE
- HYOSCINE

3. Combined oral contraceptives → Cycles become anovulatory
4. Surgical dilatation of cervix [Parous women has lesser spasmodic dysmenorrhea]
5. Pre sacral nerve ablation → Laser or thermal resection of hypogastric plexus
6. GnRH analogues → Will stop the periods

## BASIC DEFINITIONS OF MENSTRUAL CYCLE 00:39:34

- Length of menstrual cycle
  - 28 ± 7 Days

    Polymenorrhea → < 21 days

    Oligomenorrhea → > 35 days

- Duration
  - 2-7 Days

    Hypomenorrhea → < 2 days

    Menorrhagia > 7 days

- Amount
  - 30-50 ml per cycle

    Excessive blood loss → > 80 ml [menorrhagia]

- POLYMENORRHAGIA 00:42:25
  - < 21 days & > 80 ml of blood loss

- METORRHAGIA 00:42:54
  - Irregular cycles superimposed on regular cycles
  - Intermenstrual bleeding [spotting]
- MENOMETRORRHAGIA 00:44:45
  - Irregular acyclical bleeding (Ca Cervix, Polyp)

- **METEROPATHIA HEMORRHAGICA** 00:46:13
  - Prolonged amenorrhea followed by heavy withdrawal
  - amenorrhea → 2½ - 3 months
  - in a women > 40 yrs
  - Anovulatory cycle, irregular

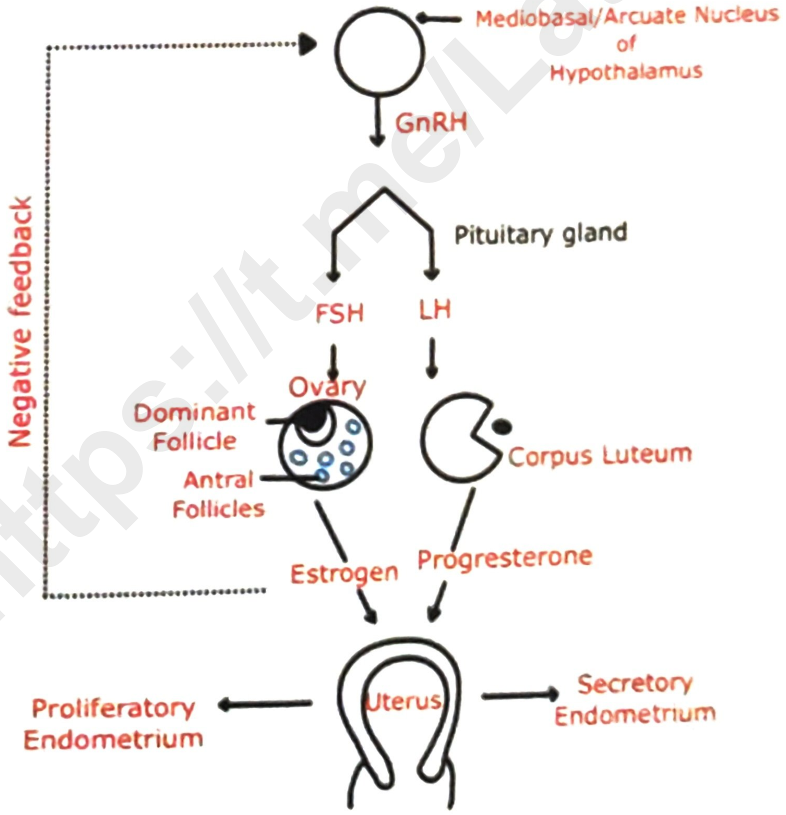
    ↓
  - Hyperplasia of endometrial glands present

    ↓
  - Non Secretory Endometrium (as no progesterone)

    ↓
  - Diagnosed by currettage & microscopic examination
  - Cystic Glandular Hyperplasia (CGH)

    [SWISS CHEESE ENDOMETRIUM]
  - Very less stroma
  - Self limited condition
  - Currettage is also curative

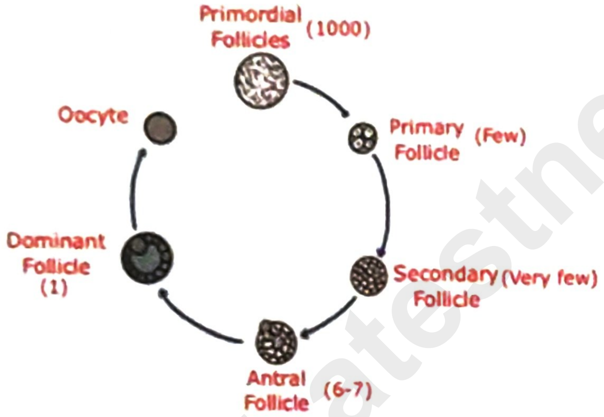
## PHYSIOLOGY



- GnRH releases in pulsatile fashion
  - 60 minutes in follicular phase [Faster (60min) in Follicular phase]
  - 90 minutes in luteal phase [Longer (90min) in LUTEAL phase]

- GRANULOSA CELL OF FOLLICLE 00:57:09
  - Sex cord cells
  - Produces estrogen

- ANTRAL FOLLICLES
  - Fluid filled follicles
  - 6-7 made every month



- Perimenopausal women have irregular cycles due to OLD follicles

  Fate of Reproduction During Perimenopausal Period

  1. Anovulatory cycle
  2. Poor oocyctes
  3. No fertilzation
  4. Poor embryos →Abort
  5. Abortion [40% after 40 years]

- > 35 yrs Pregnancies → ELDERLY GRAVIDAS

  indicated for
  - LEVEL II scanning
  - Triple markers, dual markers
  - Amniocentesis

## OVARIAN RESERVE

01:25:44

| QUANTIFICATION | OVARIAN RESERVE |
|---|---|
| 1. ↓ ANTRAL FOLLICULAR COUNT [Young → 6 to 7, older → 1] | ↓ |
| 2. ↓ OVARIAN VOLUME [young → 3.5 x 2.5 x 3cm, older → 1 x 1.5 x 1cm] | ↓ |
| 3. ↑ AGE | ↓ |
| 4. ↓ ESTROGEN | ↓ |
| 5. ↑ FSH → [younger → 2 to 6IU, Older → › 15IU] | ↓ |
| 6. ↓ ANTI MULLERIAN HORMONE → made from granulosa cells of ovary | ↓ |

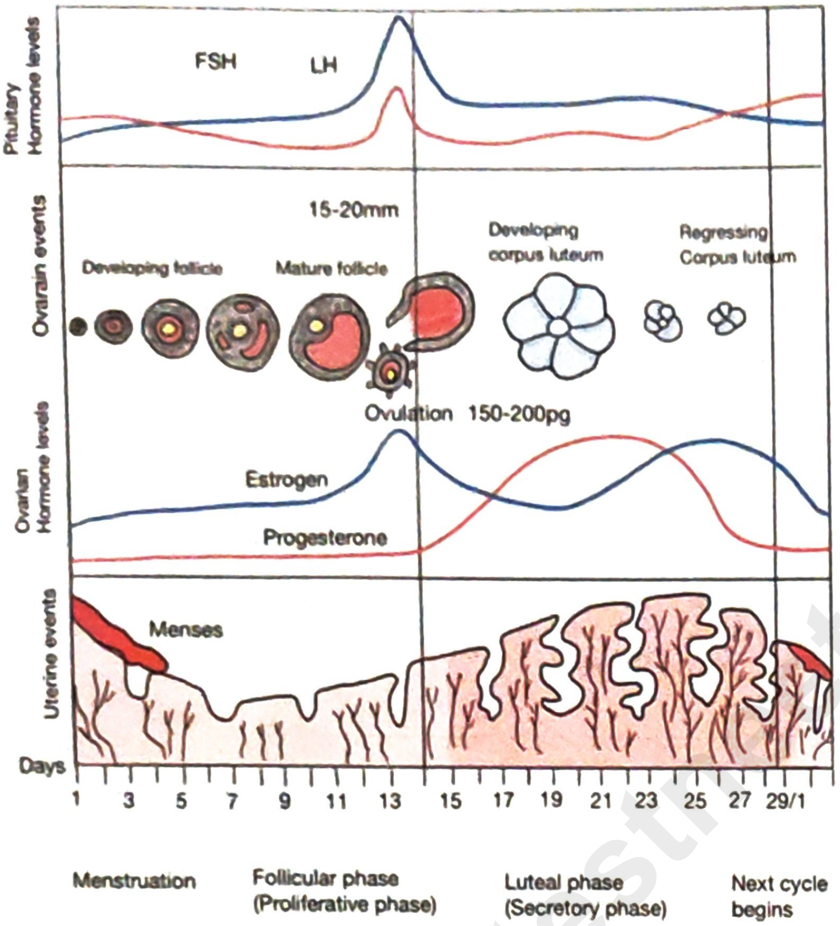
01:30:50

Purpose of FSH → Estrogen production
Purpose of LH → Progesterone production

## GOOD INDICATORS OF OVARIAN RESERVE

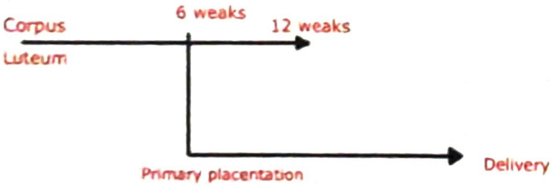
- AFC
- FSH
- AMH [single best for assessment]

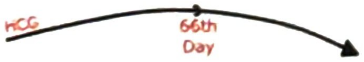
- Normal FSH → 2-6 IU
  - › 10 IU → suggestive of Menopausal women
  - › 40 IU → Diagnostic of Menopause



## MAINTAINANCE OF PREGNANCY

- Exclusively maintained by CORPUS LUTEUM upto 6wks
  - corpus luteum remains up to 12wks in pregnancy
- By corpus luteum & placenta → from 6-12 weeks
- Only by placenta → after 12 weeks
- Luteo-placental shift occurs at 6 weeks





- Hyperemesis is maximum at 66th day [9 wks + 3days]
- Abortion can be Prevented by → Progesterones
  → HCG

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- SPINBARKIET STERCHABILITY [cervical mucus stretchability] [max. at 14th day]

  ↓

  On drying

  ↓

  FERNING/ARBORIZATION PATTERN [NaCl crystals]

- FERTILE PERIOD → 11th to 16th day
  - Life span of sperm → 72 hrs
  - Life span of ovum → 24-48 hrs

CASE

- On 24th day of cycle
- Cervical mucus is thick
- No oocyte

} fertilization doesn't occur

- SAFE PERIOD → Before 11th day & after 16th day

BILLING METHOD

- Natural method of contraception
- Based on cervical mucus physiology

PROGESTERONE ONLY PILLS [POP]

Mechanism of action

- Cx mucus on 14th day → thick & viscid
- Anovulation [No oocyte]
- Unfavorable for implantation
  - Hyper secretory endometrium [OUT OF PHASE ENDOMETRIUM - pinopods are internalized]
- Failure rate → 1 to 2%

Hormonal Management

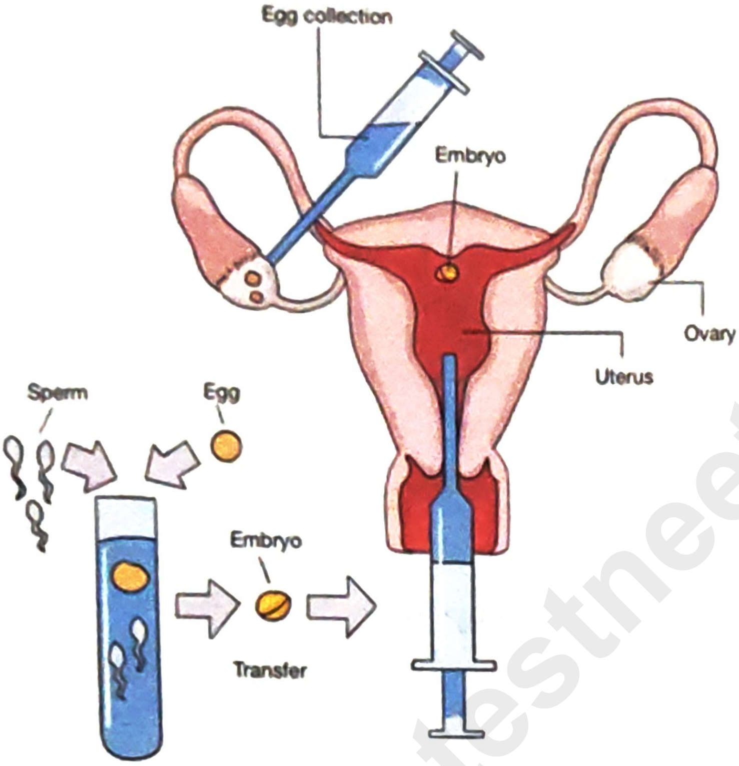
02:22:20

- 1st line hormonal management of abnormal uterine bleeding
  - PROGESTERONE
  - Stabilizes endometrium in a physiological way

- Next line of management → ESTROGEN
- First line of drug in acute SEVERE Menorrhagia → ESTROGEN

## IVF

02:29:13



- CONTROLLED OVARIAN HYPERSTIMULATION
  - Give FSH injection [multiple] from beginning of the cycle, many follicles will be recruited
- On 14th day, under general anesthesia & take all oocytes from the follicles with the help of TVS
- Take few of best oocytes & put them into test tube
- Fertilize with sperm in test tube → Embryo formed
- Put the embryo back in the uterus
- Excess embryos are stored in liquid $N_2$ [- 196° c] [FROZEN EMBRYO TRANSFER]
- 1st IVF baby → LOUISE BROWN [1978]
- 1st IVF done by → STEPTOE & EDWARDS
- In 2010, Noble prize given to EDWARDSosa[notmuspropria]

## Chapter 2

# OVARIAN HYPERSTIMULATION SYNDROME

## CONTROLLED OVARIAN HYPER STIMULATION

00:00:45

- 200 x 15 eggs → 3000 pg of Estradiol
  200 x 40 eggs → 8000 pg of Estradiol
- › 3500 pg of Estradiol leads to
  - Vascular endothelial growth factor
    Renin, pro rennin
    Angiotensin
    } ↑ VASCULAR PERMEABILITY

↑ VASCULAR PERMEABILITY

INTRAVASCULAR COMPARTMENT

↓

Fluid shifts → Hemoconcentration → › 45 or › 55

Ⓝ packed cell volume [HCT] -33

↓

Thrombo embolic phenomenon

↓

Renal Emboli
Cerebral Emboli
Hepatic Emboli
Limb Emboli

↓

Third space collections
- Ascitis
- Pleural effusion
- Pericardial effusion
- Edema

- Torsion
  Rupture of ovary
  Hemorrhage
- COH $\xrightarrow{\text{may leads to}}$ OVARIAN HYPER STIMULATION SYNDROME

## OVARIAN HYPER STIMULATION SYNDROME 00:10:23

### PRE DISPOSING FACTORS

- Inj HCG [Initiating factor] [used for rupturing the follicle]
- Vascular endothelial growth factor
- Renin, pro renin
- Angiotensin
- HCG along with these 3 leads to COH

## MATHUR CLASSIFICATION 00:11:00

| | | | |
|---|---|---|---|
| • MILD | <8cm | No Ascitis | |
| • Moderate | 8-12 | USG Ascitis | |
| • Severe | >12 cm | Clinical Ascitis | HCT → 45 |
| • Critical | | Tense Ascitis | HCT → 55 |

- No pregnancy is advised in severe & critical OHSS
- Frozen embryos are transferred on 6th day of ovulation

## MANAGEMENT 00:17:30

Rx of OHSS

- Avoid pregnancy in severe & critical forms
- Remove fluids → Tap Ascites & effusion
- Give oral fluids [Mild, moderate forms]

  IV Fluids → NaCl, DNS [crystalloids]

  → Albumin, Dextran, starch [colloids]

* Colloids will hold the fluid in the Intra-vascular space

- MC → 13-15% of pts on CLOMIPHENE CITRATE

  Severe forms → GONADOTROPINS

  - Inj HMG [Human Menopausal Gonadotropins]

    Inj FSH recombination

- COMBINED ORAL CONTRACEPTIVE PILLS 00:21:14

- Tab estradiol + tab progesterone
- Painless, regular, anovulatory cycles and contraception
- Tab ESTRODIOL & tab PROGESTERONE are responsible for menses

→ ARTIFICIAL PERIODS

- ETHINYL ESTRADIOL → 0.03 mg → 30 µg

- ADVANTAGES OF COCPs 00:32:32
  - ↓ Bleeding
  - ↓ Anemia
  - ↓ Ca ovary
  - ↓ Ca colon
  - ↓ Fibroids
  - ↓ Benign breast disease
  - ↓ Ovarian cyst
  - ↓ PID

- DISADVANTAGES OF COCPs 00:33:28
  - ↑ Ca cervix [Adeno carcinoma type]
  - ↑ Chlamydia PID [Quite / indolent]
  - ↑ Gall stones

- NO EFFECT on incidence of Ca BREAST

Due to OCP's:

- ↑ GALL STONES → GALL BLADDER CANCER ???
  - COCP causes smooth type of gall stones [not predisposed for CA]
  - Gall bladder cancer is caused by mixed & pigment gall stones
- HEPATIC ADENOMA caused by COCPs

  HEPATO CELLULAR CARCINOMA is not caused by COCPs
- Generally COCPs are started on the 1st day of menstrual cycle can be started any time of menstrual cycle → QUICK START

- CONTRA INDICATIONS 00:38:55

  Breast feeding

  Post partum

  Uncontrolled HTN [> 160/100]

  Active breast cancer

Uncontrolled diabetes mellitus

Severe cirrhosis

Active hepatitis

On anticonvulsants

Hyper lipidemia

Earlier DVT

Earlier pulmonary embolism

# TESTS OF OVULATION

TESTS OF OVULATION 00:001:5

1. BBT→ ↑ 0.5°F
2. S.LH→ >15 IU
3. S.progesterone on day 21 [>3ng/ml]
4. Serial USG → Follicular monitoring [OPD -usual]
5. Premenstrual Endomentrial Biopsy on day 21 00:02:15
    - to check secretory changes
    - When the difference b/w observed & expected changes is > 2 days → LUTEAL PHASE DEFECTS

6. CERVICAL MUCUS STUDIES 00:05:54
    - Spinbarkiet & ferning is due to estrogen
    - Serial cervical mucus studies
    - LOSS of SPINBARKIET & FERNING → OVULATION
7. DIAGNOSTIC LAPAROSCOPY

## Chapter 4

# ENDOMETRIOSIS ADENOMYOSIS

https://t.me/Latestreetpgnotes

ETIOLOGY 00:01:10

RETROGRADE MENSTRUATION

- Proposed by SAMPSONS [SAMPSONS IMPLANTATION THEORY]
- 70 to 80% of all women have retrograde menses
- among them 5-10% of all women have poor immunity & ↑ estrogenecity & develop endometriosis

AGE OF PRESENTATION → 3rd to 4th decade [25-35 yrs of age]

DIAGNOSIS

- ↑ CA 125
- USG, MRI
- Laparoscopy [best]

SITES OF PREDILICTION

- MC site → ovary
- 2nd mc site → POD
- Bowel
- Lung [periodic hemoptysis] } VICARIOUS MENSTRUATION
- Nose [Periodic epistaxis] }
- Eyes [Periodic sub conjunctival hemorrhage]

PATHOLOGY 00:03:43

- POWDER BURN LESIONS/ BLUE SPOTS
- CHOCOLATE CYST OF OVARY
- Scarring & adhesions with fallopian tube → INFERTILITY

## SYMPTOMS

00:08:09

- Chronic pain
- Acute monthly exacerbation → Severe congestive dysmenorrhea
- Deep dysparunia
- Menorrhagia
- Infertility [due to tuboovarian relation by adhesion]
  - ↓ ↓ intercourse
  - Poor ovulation
  - EMBRYOTOXIC ENDOMETRIOTIC DEPOSITS
    - ○ poor quality embryos
    - ○ ↓ implantation
    - ○ ↑ Abortion

## TREATMENT

00:12:09

### SURGICAL Rx

- ADHESIOLYSIS for adhesion
- CYSTECTOMY for chocolate cysts
- ABLATION for deposits → FULGRATION OF DEPOSITS
  - THERMAL OR LASER
- 60 - 70 % RECURRENCE

## MEDICAL MANAGEMENT

00:16:53

1. Inj. Depo medroxy progesterone acetate 150 mg once in 3 months
   - Creates pseudo pregnancy state
   - Atrophy of endometrium in 3-4 months of Rx

2. Tab Danazol
   - Androgen → Anti estrogenic action
   - Faster atrophy
   - S/E → Hirsutism
     Virilization
     - Breast atrophy
     - Hoarsness of voice
     - Clitromegaly

     } Irreversible

PrepLadder

- 1st sign to stop Rx with Danazol → Hoarseness of voice

3. Combined oral contraceptive pills
    - Anovulatory cycles → painless
    - Limits endometriosis

4. GnRH ANALOGUES → DEPOT OR CONTINUOUS FORM
    - LEUPROLIN
      NAFERELIN
      GOSERLIN
    - Down regulation / desensitization of pituitary receptors
    - Atrophy of endometrium

MEDICAL MANAGEMENT AIMS AT STOPPING THE PERIODS

Q. 25yrs with chocolate cyst. Sx Rx done → what next → medical management

A. Medical management till conception
- Pregnancy
- COCPs
    - 21 x 4 packs → 84 days continuously
      Periods ≡ once in 90 days

- GnRH analogues
    - > 6 months
      estrogen dependent osteoblastic action will stop
      Estrogen independent osteoclastic action will continue
      } OSTEOPOROSIS

- ADD BACK REGIME

  Low dose estrogens

  RALOXIFINE [Selective Estrogen Receptor Modulator]

## ADENOMYOSIS/ ENDOMETRIOSIS INTERNA 00:39:19

SEEN IN

- Multiparous women
- > 40 yrs
- 30% of hysterectomy specimens

ENDOMETRIOSIS INTERNA → endometriosis with in uterus

### ASSOCIATED WITH

- Menorrhagia
- Progressive dysmenorrhea
- Infertility in young women [Rare]

UTERUS → Uniformly enlarged & ≤ 14 weeks size of pregnant uterus [14cm]

### DIAGNOSIS 00:45:44

1. USG, MRI
   - Sub endometrial halo present
   - Hetero echoic deposits in uterine myometrium
   - Ill defined hypoechoic areas → LAKES OF ENDOMETRIAL BLOOD
   - Junctional zone b/w endometrium & myometrium
   - normal → 5-8 mm
   - Adenomyosis → >12 mm [diagnostic]

00:48:58

2. UTERINE BIOPSY/ POST HYSTERECTOMY UTERINE ANALYSIS
   - Endometrial glands within uterine muscles → Pathogonomic
   - Diffuse localized adenomyosis

### TREATMENT 00:51:04

1. Menorrhagia → NSAIDS, Hormones
2. Young women → Hormones

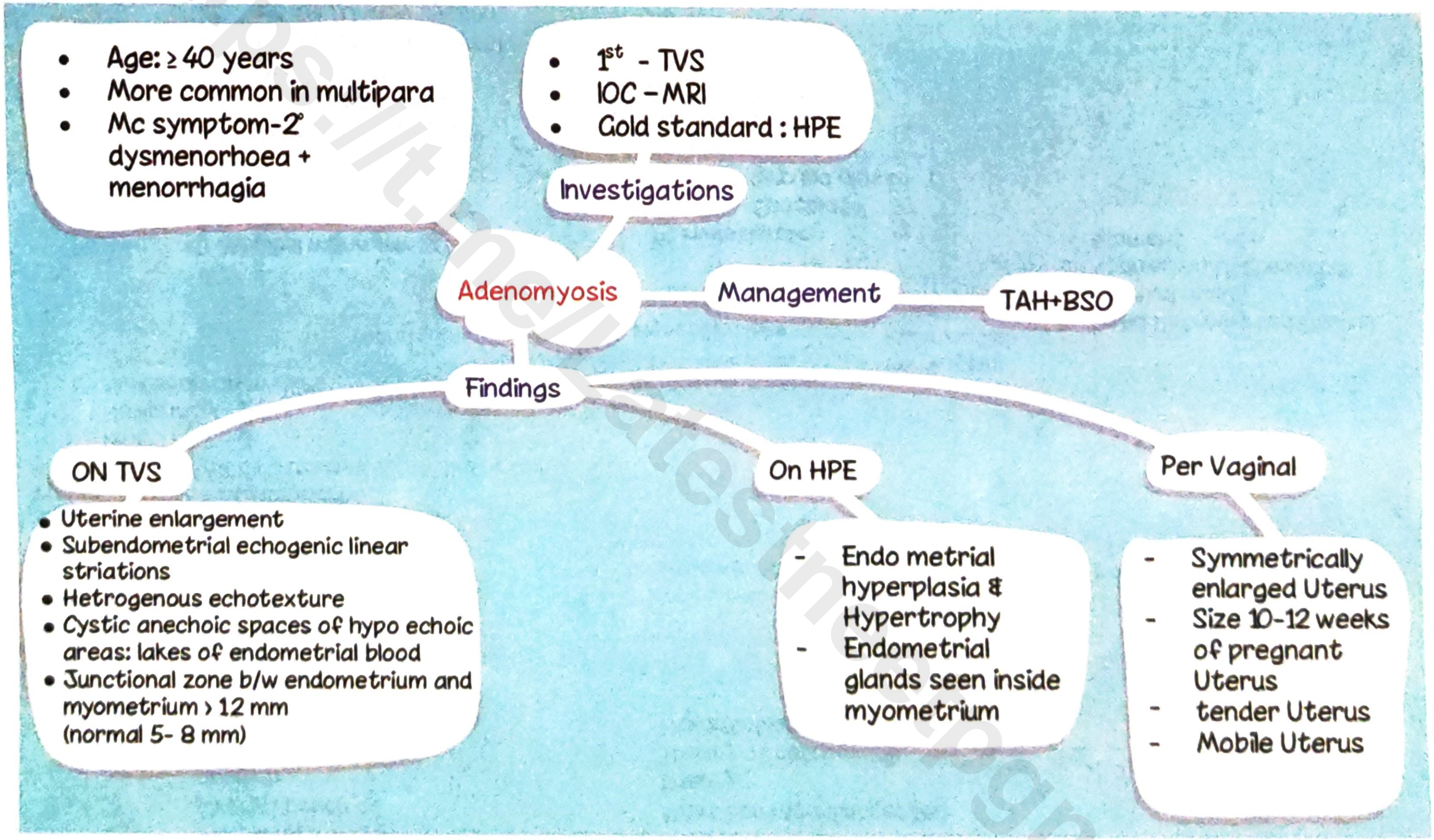
COCPs for longer duration

IUCD's with PR [mirena]

localized excision

3. Surgical Mx of Menorrhagia → D & C

4. Overall best Rx → Hysterectomy



**Adenomyosis**

- Age: ≥ 40 years
- More common in multipara
- Mc symptom-2° dysmenorhoea + menorrhagia

**Investigations**

- 1st - TVS
- IOC – MRI
- Gold standard : HPE

**Management**

TAH+BSO

**Findings**

ON TVS

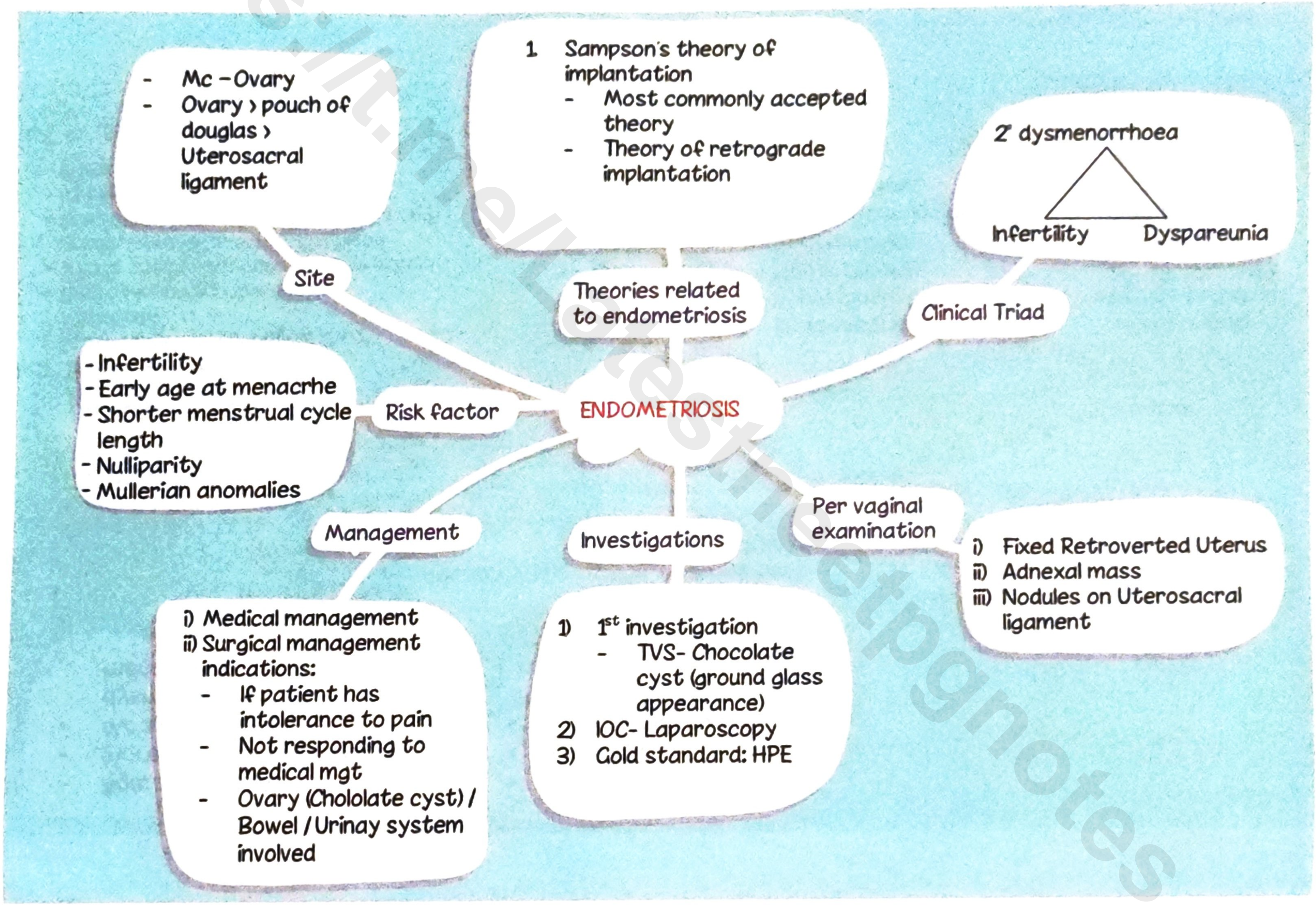
- Uterine enlargement
- Subendometrial echogenic linear striations
- Hetrogenous echotexture
- Cystic anechoic spaces of hypo echoic areas: lakes of endometrial blood
- Junctional zone b/w endometrium and myometrium > 12 mm (normal 5- 8 mm)

On HPE

- Endo metrial hyperplasia & Hypertrophy
- Endometrial glands seen inside myometrium

Per Vaginal

- Symmetrically enlarged Uterus
- Size 10-12 weeks of pregnant Uterus
- tender Uterus
- Mobile Uterus



**ENDOMETRIOSIS**

**Theories related to endometriosis**

1 Sampson's theory of implantation
  - Most commonly accepted theory
  - Theory of retrograde implantation

**Clinical Triad**

**Site**

- Mc – Ovary
- Ovary › pouch of douglas › Uterosacral ligament

**Risk factor**

- Infertility
- Early age at menacrhe
- Shorter menstrual cycle length
- Nulliparity
- Mullerian anomalies

**Per vaginal examination**

i) Fixed Retroverted Uterus
ii) Adnexal mass
iii) Nodules on Uterosacral ligament

**Investigations**

1) 1st investigation
   - TVS- Chocolate cyst (ground glass appearance)
2) IOC- Laparoscopy
3) Gold standard: HPE

**Management**

i) Medical management
ii) Surgical management indications:
   - If patient has intolerance to pain
   - Not responding to medical mgt
   - Ovary (Chololate cyst) / Bowel / Urinay system involved

## Chapter 5

# HORMONAL REPLACEMENT THERAPY

## EFFECTS OF ESTROGEN DEFICIENCY AFTER MENOPAUSE 00:01:34

1. SKIN → S/C Collagen ↓ → Lax -loose skin
2. HAIR → ↓ vellous hair → Soft, thin & light in color
   ↑ Terminal hair → Hard, thick & dark in color
3. VOICE → Hoarsness of voice
4. BONES → ↑ FRACTURES
   - Vertebral compression fractures [MC]
   - Wrist fractures
   - femur fractures
5. BRAIN → Mood swings
   - Depression
   - Anger threshold ↓
   - Anxiety

   → Insomnia

   → HOT flushes [coincides with LH flush]
6. HEART → Coronary artery disease ↑
7. PELVIS → ↑ Fractures

   → Ⓝ PH of vagina → Acidic

   Glycogen $\xrightarrow{\text{lactobacillus}}$ Monosaccharides

ABSENCE OF ER → PH → Alkaline → ↓ Lactobacillus → ↑ Anaerobes
↑ Infections

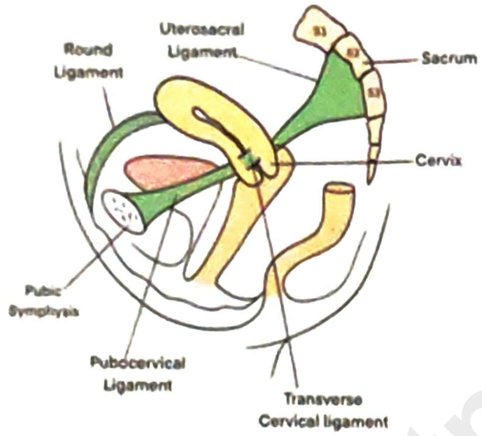
- Vaginitis
- Vulvitis
- Urethritis
- PID [Pelvic Inflammatory Disease]

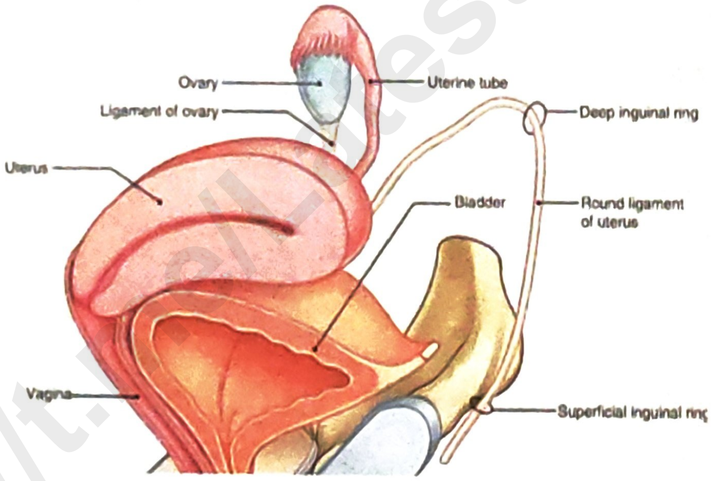
- Dry vagina → ↓ Intercourse
- Pelvic organ prolapse
  - Abnormal conduct of labor is the main reason

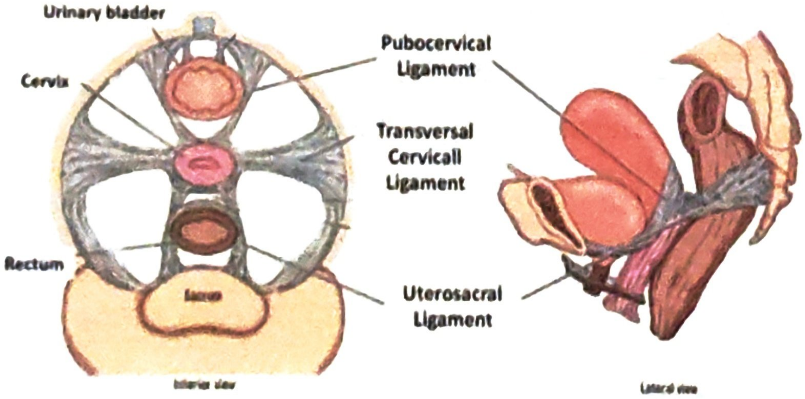
## SUPPORTS OF UTERUS

00:12:38

### LIGAMENT SUPPORT







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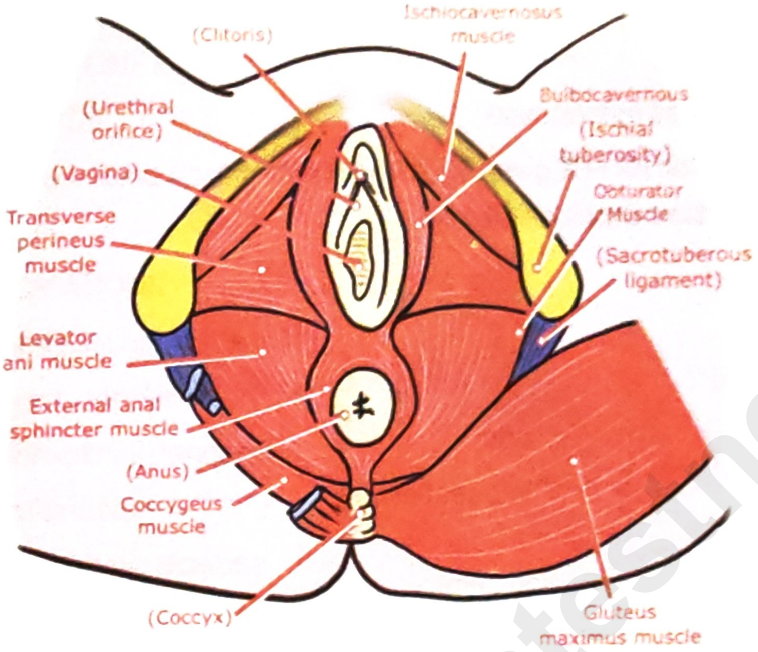
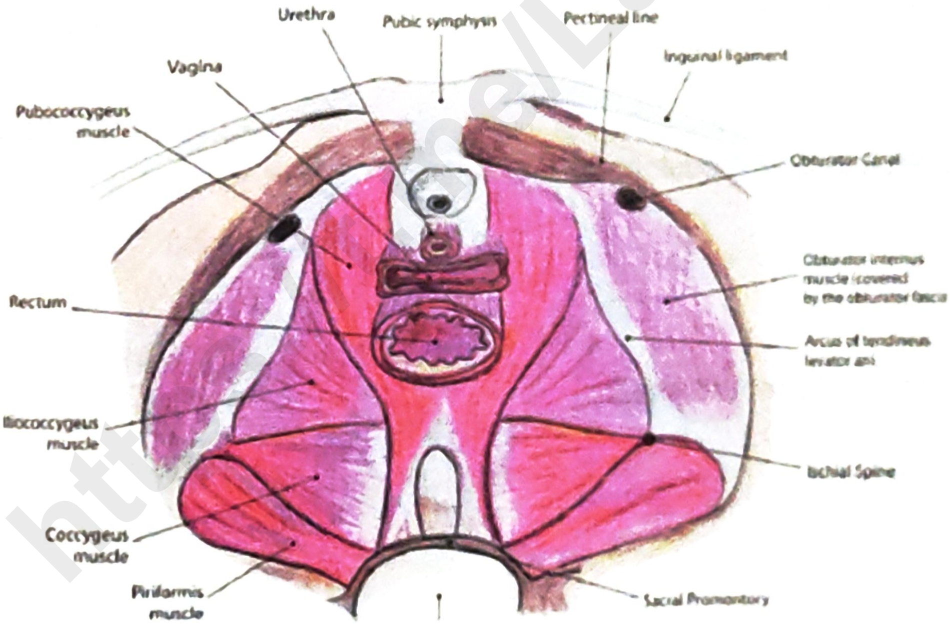
TRANSVERSE/ CARDINAL LIGAMENT/ MACKENRODT'S → Most important among ligaments

Actions of round ligaments → Anteversion & Anteflexion are maintained

## MUSCULAR SUPPORT





PELVIC FLOOR/ PELVIC DIAPHRAGM = The deepest muscle layer

## INVESTIGATIONS 00:18:41

- CBC
- Mammography
- Pap smear
- USG → Endometrium → < 4mm
- LFT [Liver function tests]
- F/PP sugars
- Lipid profile
- Serum FSH → To diagnose menopause
  → To monitor HRT [if given to younger women (premature ovarian failure)]
- ECG

## HORMONE REPLACEMENT THERAPY 00:22:04

1. Tab Estradiol 1-2 mg/day }
2. Tab Conjugated Equine Estrogens 0.65 to 1.25 mg/day } add Progesterone
3. Tab TIBOLONE
   - Synthetic estrogen
   - Progestational metabolite present
   - 2.5 mg/day
4. SERM [Selective Estrogen Receptor Modulators]

   RALOXIFENE
   - 60mg/day
   - Estrogenic on bone
   - Anti estrogenic on brain [CI for hot flushes]
5. PLANT ESTROGENS
   - Safer
   - ↓ effective
6. BISPHOSPHONATES
   - Non hormonal Rx of Osteoporosis

| | |
|---|---|
| – ALENDRONATE | daily |
| – RISEDRONATE | weekly |
| – IBANDRONATE | monthly |

7. CALCITONIN
   - ↓ osteoclastic action

8. PARATHORMONE EXTRACT

   TERIPARATIDE

   Includes new bone formation

CONTRA INDICATIONS 00:30:34

- Undiagnosed vaginal bleeding
- H/O Breast cancer
- H/O endometrial cancer
- Liver dysfunction
- Thrombo embolic disease
- Endometriosis
- Fibroids
- Porphyrias

Rx OF HOT FLUSHES 00:32:14

- DOC → ESTROGENS

  takes 20-25 days to act

- CLONIDINE HYDRO CHLORIDE

  Acute relief

  100 μg OD/BD

  ↓ vaso motor flushing

- ALPRAZOLAM

  0.25 mg

  for acute relief

- SSRI [Selective Serotonin Reuptake Inhibitors]
  FLUOXETINE
  takes 6-7 days

CORONARY ARTERY DISEASE

- Estrogens are cardioprotective
- HRT IS NOT CARDIO PROTECTIVE
  - initial few years → Cardio protective
  - Long term → Detrimental to heart
- Local estrogens are better

Q. Which condition is a C/I to start H.R.T

A. Patient with C.H.D.

# Chapter 6

# ENDOMETRIAL CARCINOMA

ENDOMETRIAL Ca

## RISK FACTORS

00:01:07

- ↑ ESTROGENS
- HRT
- TAMOXIFEN (Highly estrogenic on uterus)
- Anovulatory conditions → PCOD
- Estrogen producing ovarian cancers → Granulosa cell tumor
- Early menarche
- Late menopause
- Abnormal liver function tests
- Obesity → Fats

  Androgens
  ↓ Aromatase
  Estrogens

- Corpus cancer syndrome

  DM - HTN – Obesity

- Familial predisposition

  Ca Breast
  Ca Endometrium
  Ca Ovary
  } 1st degree female relatives can have either of these

- Nulliparous women

- 80% of this etiology associated with Ca endometrium → TYPE 1
- 20% of this etiology No association → TYPE 2

- ETIOLOGY 00:07:42
  - Hyperplasias → Cancer
  - Age group → 45-55 yrs

- HYPERPLASIAS [Pre malignant] 00:08:32

| | |
|---|---|
| Simple Hyperplasia without atypia → 1%<br>Complex Hyperplasia without atypia → 3% | Give PROGESTERONE THERAPY |
| Simple Hyperplasia with atypia → 8%<br>Complex Hyperplasia with atypia → 29% | Do SIMPLE HYSTRECTOMY |

SYMPTOMS 00:13:00

- Irregular acyclical bleeding [mc]
- Post menopausal bleeding
- Pyometra → dirty foul smelling vaginal discharge

~~Loss of weight~~
~~Loss of appetite~~
~~Ca cachexia~~
~~Ca Pain~~ ⟶ Late presentation

HISTO PATHOLOGY 00:15:28

- Endometroid adeno carcinoma [mc] [80%]
- Papillary /villo glandular
- Squamous
- Secretory

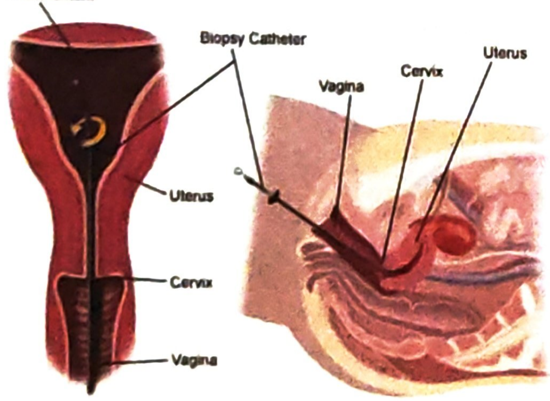
DIAGNOSIS 00:16:56

- 1st management

PIPELLE ENDOMETRIAL BIOPSY [in OPD]

- Paracervical block may be required in few cases
- 90-95% sensitive
- Biopsy taken from anterior wall

**Endometrial Biopsy**



- FRACTIONAL CURRETTAGE [D & C]
  - 95-99% sensitive
  - Done in OT

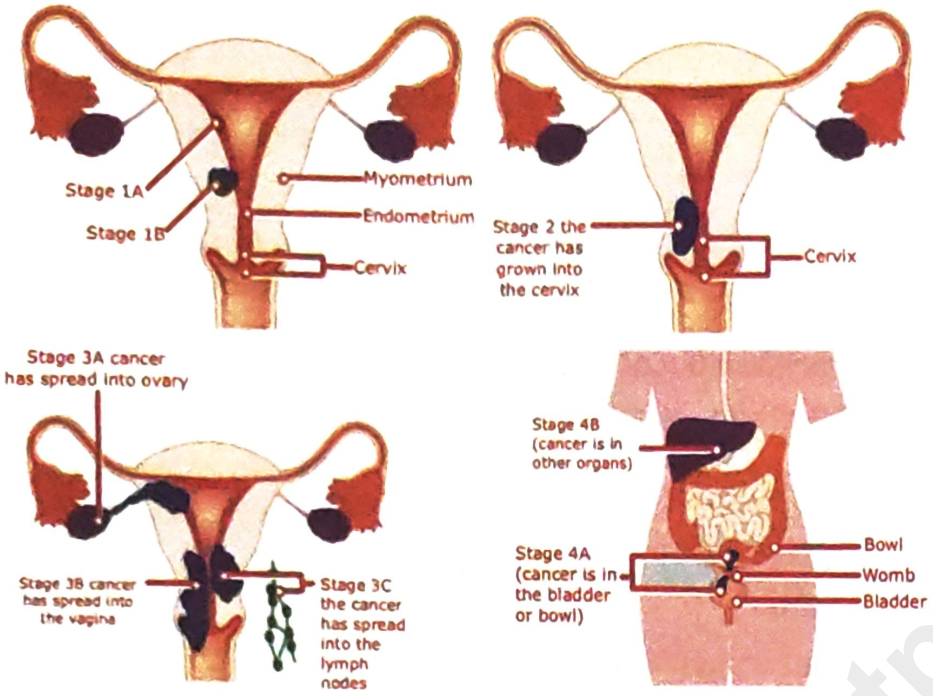
- HYSTEROSCOPIC BIOPSY
  - 100% sensitive

- TVS is a helpful adjunction procedure but not the best
- ET should be 4mm to be called normal

## STAGING OF Ca ENDOMETRIUM 00:22:56

2009 FIGO staging system for carcinoma of the endometrium

| | |
|---|---|
| Stage I | Tumor contained to the corpus uteri |
| IA | No or less than half myometrial invasion |
| IB | Invasion equal to or more the half of the myometrium |
| Stage II | Tumor invades the cervical stroma but does not extend beyond the uterus |
| Stage III | Local and/or regional spread of tumor |
| IIIA | Tumor invades the serosa of the corpus uteri and /or adnexas |
| IIIB | Vaginal and/or parametrial involvement |
| IIIC | Metastases to pelvis and/or para-aortic lymph nodes |
| IIIC1 | Positive pelvic nodes |
| IIIC2 | Positive para-aortic lymph nodes with or without positive pelvic lymph nodes |
| Stage IV | Tumor invades bladder and/or bowel mucosa and/or distant metastases |
| IVA | Tumor invasion of bladder and/or bowel mucosa |
| IVB | Distant metastases, including intra-abdominal metastases and or inguinal lymph nodes |

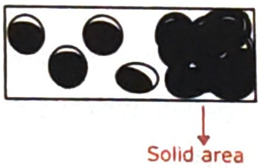

Stage 1A
Stage 1B
Myometrium
Endometrium
Cervix
Stage 2 the cancer has grown into the cervix
Cervix
Stage 3A cancer has spread into ovary
Stage 3B cancer has spread into the vagina
Stage 3C the cancer has spread into the lymph nodes
Stage 4B (cancer is in other organs)
Stage 4A (cancer is in the bladder or bowl)
Bowl
Womb
Bladder

All cancers in gynecology staged surgically except ca cervix [clinical staging]

PROGNOSTIC FACTORS 00:27:15

- Hysterectomy → Staging
- Pelvic lymphadenectomy
- Grading → Solid areas on histopathology slides

Grade I → <5% solid areas
Grade II → 5-50% solid areas
Grade III → > 50% solid areas



Single best prognostic marker → Staging > Grading

- Age
- Type
- Estrogen Receptor & Progesterone receptors status
- Previous Rx taken

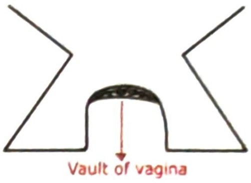
TREATMENT 00:31:50

- Hysterectomy is already done
- Stage I/II 00:32:24

Grade I, Myometrium <1/2 involved → Nothing required
Grade II, Myometrium < 1/2 involved → Vaginal irradiation
Grade III, Uterine serosa involved → Pelvic irradiation
Adnexal or cervical involved → Whole abdominal irradiation

- Stage III/ Stage IV 00:35:10
  - Radiotherapy
  - Surgical therapy
  - Chemo therapy
  - Hormonal therapy

- VAULT OF THE VAGINA



  - Left over vagina after hysterectomy
  - 1st site of recurrence
  - 1st line Mx of recurrence → HIGH PROGESTERONE [200-250 mg/day]
  - Prevention of recurrence → VAGINAL IRRADIATION

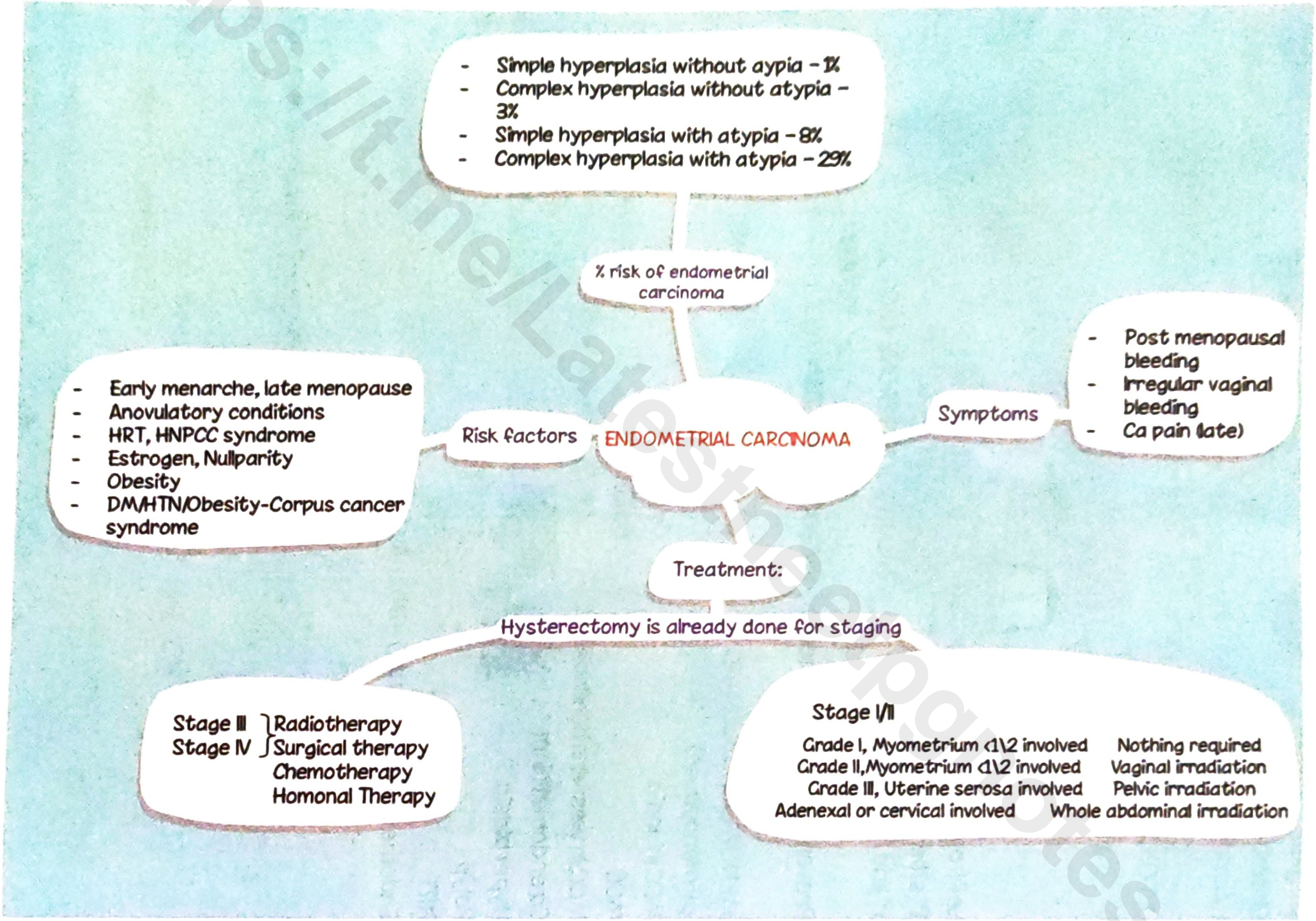
## POST MENOPAUSAL BLEEDING 00:38:42

(> 1 yr of menopause)

- MCC in India → Ca Cervix
- MCC → Ca Cervix
- MCC in western hemisphere:
  - Ca endometrium → 10%
  - Hyperplasia → 10%
  - Polyps → 10% - 12%
  - HRT → 30%
  - Endometrial Atrophy (60 – 70%) (MC)

For more notes visit

Or click this page to visit the channel



ENDOMETRIAL CARCINOMA

% risk of endometrial carcinoma

- Simple hyperplasia without aypia – 1%
- Complex hyperplasia without atypia – 3%
- Simple hyperplasia with atypia – 8%
- Complex hyperplasia with atypia – 29%

Risk factors

- Early menarche, late menopause
- Anovulatory conditions
- HRT, HNPCC syndrome
- Estrogen, Nullparity
- Obesity
- DM/HTN/Obesity-Corpus cancer syndrome

Symptoms

- Post menopausal bleeding
- Irregular vaginal bleeding
- Ca pain (late)

Treatment:

Hysterectomy is already done for staging

Stage I/II

| | |
|---|---|
| Grade I, Myometrium <1\2 involved | Nothing required |
| Grade II, Myometrium <1\2 involved | Vaginal irradiation |
| Grade III, Uterine serosa involved | Pelvic irradiation |
| Adenexal or cervical involved | Whole abdominal irradiation |

Stage III, Stage IV
- Radiotherapy
- Surgical therapy
- Chemotherapy
- Homonal Therapy

# Chapter 7

# OVARIAN TUMORS

## OVARIAN TUMORS

- 3 x 3.5 x 2.5 cm - size of normal ovary
- Almond shaped
- Rough surface due to scars by ovulation

Nulliparous
Ovulation induction
Early menarche
Late menopause
Perineal talc
Asbestosis exposure

} ↑ scars

ETIOLOGY 00:01:27

1. SCARS

↑ scars → Epithelium → over healing → Epithelial ovarian CA

2. Associated with Mutations in:
   - BRCA 1 [On chromosome 17]
   - BRCA 2 [On chromosome 13]
3. Familial Predisposition
   - ② 1st degree Relatives with cancers → 35-40% chance
   - ① 1st degree Relative
   - ① 2nd degree Relative

   } 2 to 10 times chances
   - 70% of all ovarian cancers → Surface epithelial ovarian cancers
   - Age group → 6th 7th decades
   - Mostly bilateral
   - Associated with ↑ CA 125

   Significant values in a post menopausal women → › 35

   Pre menopausal women → › 200

## CLINICAL FEATURES 00:11:21

- BIG Abdominal mass → mostly benign

## DIAGNOSIS 00:15:17

- USG features of malignancy TVS > TAS
  Bilateral
  Surface irregularities
  Cystic +solid areas together
  Septated tumors - irregular, thick
  Ascites present

## TREATMENT 00:18:10

### STAGING LAPAROTOMY + OPTIMAL DEBULKING

- STEPS OF STAGING LAPAROTOMY

1. Midline incision / Paramedian incision
2. Asses pelvis, Abdominal organs
3. Washings/ Ascites → for cytology [malignant cells]
4. Infra colic omentectomy
5. Peritoneal biopsy
6. Retroperitoneal lymph node sampling

- OPTIMAL DEBULKING
- < 1.5 cm is what maximum amount can be left

### OVARIAN CANCER STAGING 00:27:54

STAGE I → OVARIAN INVOLVEMENT
IB → One ovary involved
IB → Both ovaries involved
IC → A/B
$C_1$ → Surgical spill
$C_2$ → Surface growth
$C_3$ → Malignant Ascites/ washings
STAGE II → PELVIS INVOLVEMENT
IIA → Uterus, fallopian tubes
IIB → other pelvic organs

STAGE III → ABDOMINAL VISCERAL INVOLVEMENT

IIIA$_1$ → Retro peritoneal lymph node involvement

A$_1$ (i) → < 10mm

A$_1$ (ii) → > 10mm

IIIA$_2$ →Microscopic abdominal involvement

IIIB →Macroscopic involvement <2cm } superficial liver

IIIC →Macroscopic involvement >2cm } spleen involvement

STAGE IV

IVA → Malignant pleural effusion

IV B → Deep liver & spleen deposits

Inguinal lymph node involvements

Rx 00:37:56

CHEMOTHERAPY → PLATINUM BASED

1. Epithelium ovarian tumor 00:41:08

a. Cyclophosphomide

Adreomycin

Platins { Cis, Carbo

b. Platins, Toxol } Better choice

2. GERM CELL TUMORS 00:42:13

a. VINCRISTINE

BLEOMYCIN

PLATINS

b. BLEOMYCIN, ETOPSIDE, PLATINS } Better Choice

3. SEX CORD TUMORS 00:43:34

- Surgery alone will suffice mostly

RADIOTHERAPY 00:44:12

- Normal ovary radiosensitive

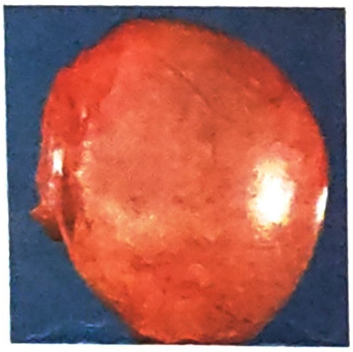
  Ovarian tumors radioresistant

  - EXCEPTION → DYSGERMINOMA

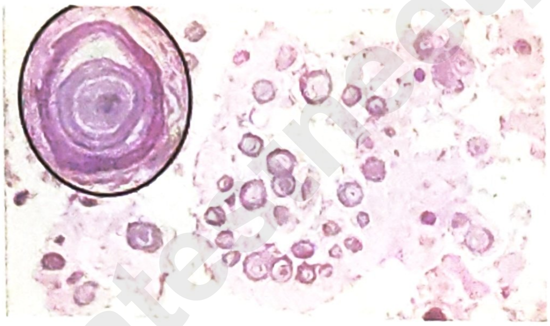
## EPITHELIAL OVARIAN TUMORS 00:47:15

- MC [75%]
- Older age group
- Bilateral
- TYPES

1. SEROUS CYSTADENOMA [mc type]
   - Unilocular
   - B/L in >50%
   - Mostly malignant
   - Surface growth present
   - Psammoma Bodies present in 40-45%
   - Cells are like fallopian tube



Serous Cystadenoma



Psammoma Body

2. MUCINOUS CYSTADENOMA
   - Less malignant
   - B/L in 10%
   - Multilocular
   - Pseudomyxoma peritonei → Severe hypoproteinemia
     - MC cause in ovarian tumor → mucinous cystadenoma
     - MC cause (Overall) → Appendiceal cancer
   - Cells are like cervix
3. BRENNER TUMOR
   - Mode of transitional cells
   - NESTS → WALTHARD INCLUSIONS
   - PUFFED WHEAT TYPE
   - Benign

- Rubbery in consistency
- Cells are like bladder
- Associated with post menopausal bleeding
- Associated with Pseudomeig syndrome
  - Pseudomeig syndrome is mcly due to Brenner tumor

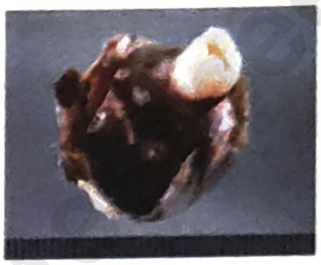
| MEIG SYNDROME |
|---|
| Fibroma Ovary |
| Ascites |
| Pleural effusion |

### 4. ENDOMETROID TUMOR

- Endometrial type of collections
- 6- 8% of epithelial ovarian tumors

## GERM CELLS TUMORS

01:00:39



Dermoid

- Younger age group
- Unilateral

### 1. TERATOMAS [MC]

Malignant [10% of teratomas]

- Dermoid /Benign cystic teratoma [90% of teratomas]
- All 3 germ layers present

Endoderm
Mesoderm
Ectoderm
} Bone, teeth
Sebaceous secretion
Hair, Endocrine glands

- 10-15% are bilateral
- Dermoids can have malignant transformation → Sq. cell carcinoma
- Dermoids are MC tumors of pregnancy
- Dermoids are MC tumors of torsion

### 2. DYSGERMINOMA

- Mc germ cell malignancy [40-45%]
- Only B/L germ cell malignancy[10-15%]
- Associated with dysgenic gonads
- Large fleshy tumor
- Mostly malignant → Poor prognosis

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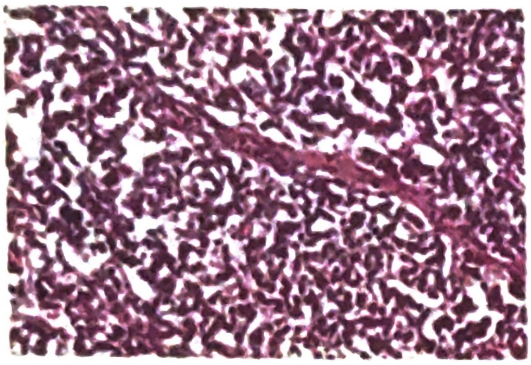
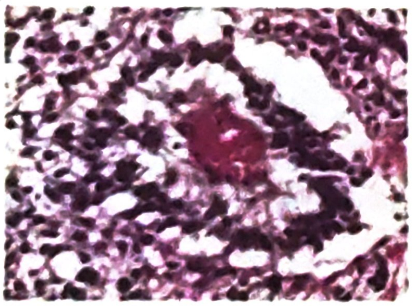
- SEMINOMA TYPE CELLS
  - Large polygonal cells with
  - Clear cytoplasm & dark stained nucleoli with back to back arrangement



SEMINOMA CELLS

- Associated with
  - ↑ LDH
  - ↑ Placental alkaline Po4
  - Alpha feto protein → Not increased

### 3. YOLK SAC/ ENDODERMAL SINUS TUMOR & EMBRYONAL TUMORS COMMON FEATURES

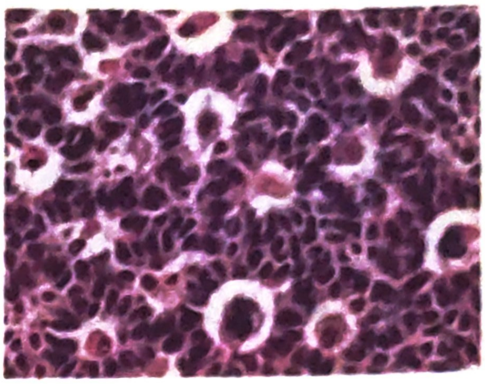
| Yolk sac tumor | Embryonal tumor |
|---|---|
| – Young women & girls<br>– Poor prognosis<br>– ↑ Alpha feto protein | |
| - ↑ $\alpha_1$ anti trypsin<br>- Schiller Duval bodies<br> | - HCG |

## SEX CORD TUMORS

01:13:24

### 1. GRANULOSA CELL TUMORS [MC]

- ↑ Estrogens
  - Precocious puberty
  - Menorrhagia
  - Endometrial cancer



CARL EXNER BODIES

- Marker → Inhibin
- CARL EXNER BODIES
- Contralateral ovarian secondaries prior to systemic secondaries

### 2. SERTOLI LEYDIG TUMORS / ARRHENOBLASTOMAS

- Hirsutism → Male pattern baldness
- Virilization → Permanent changes
  - Hoarsness
  - Breast atrophy
  - Clitoromegaly

- Oligomenorrhea to amenorrhea
- Benign
- Rapid onset hirsutism

## HIRSUTISM

01:18:16

- Rapid Onset → Seen in ovarian or adrenal tumors
  Puberty Onset → Seen in congenital Adrenal Hyperplasia
  Adult Onset → Seen in PCOS
- Causes → 25% → Idiopathic
  → 75% → 2° (MC → PCOS)
- MC cause of Hirsutism → PCOS

## NON NEOPLASTIC OVARIAN CYSTS 01:21:50

- FOLLICULAR CYST
  CORPUS LUTEAL CYST
  THECA LUTEIN CYST → d/t ↑ HCG → Seen in molar pregnancy, twin preg
  HEMORRHAGIC CYST
- Resolves by themselves → CONSERVATIVE MANAGEMENT
- MC ovarian tumor of pregnancy → Dermoid > serous cyst
- If it is small [< 5cm] & asymptomatic → No Rx required
- If it is large [> 10cm] & asymptomatic → Remove it in 2nd trimester
- If diagnosed in 3rd trimester → Remove 6 wks after delivery
- If doing a cesarean section → Remove at the time of CS

Secondary to ovary:

Mcly from Ca stomach > Ca breast

↓ Known as

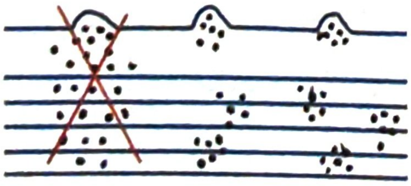
## KRUKENBERG TUMOR 01:30:12

- Secondary of ovary from Ca stomach
- Bilateral
- Firm to solid
- May have cystic degenerations
- Ovary retains its shape

## BORDERLINE EPITHELIAL OVARIAN TUMORS 01:32:03

**FEATURES**

- Epithelial hyperplasia
- Mitotic activity present
- Nuclear atypia present
- Detached cell clusters present
- No destructive stromal invasion



## Chapter 8

# POLYCYSTIC OVARIAN SYNDROME

### POLYCYSTIC OVARIAN SYNDROME

- aka STEIN LEVINTHAL SYNDROME

### FEATURES 00:01:23

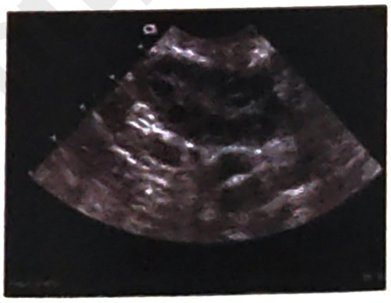
- Anovulation
- Hirsutism ⟶ Due to hyperandrogenesim
- Obesity ⟶ Due to insulin resistance
- Oligomenorrhea
- Amenorrhea
- Infertility

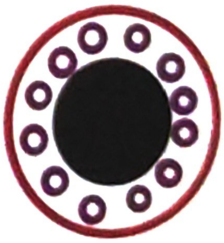
### LAB PARAMETERS 00:02:11

- LH : FSH
- Serum testosterone
- Serum androstenedione
- SHBG [Sex Hormone Binding Globulin]
- Serum Insulin

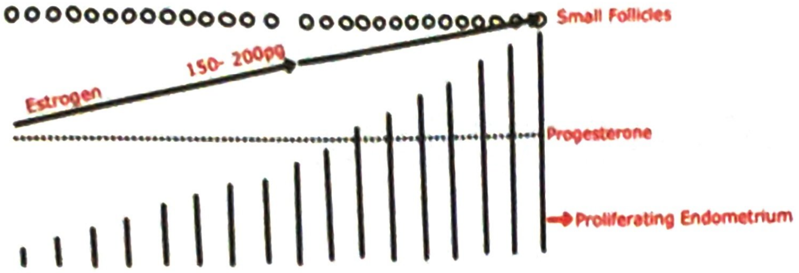
### APPEARANCE → MISNOMER 00:04:43

- MULTIPLE SMALL FOLLICLES around the periphery of ovary
  - 2 - 6 mm [< 9mm]
  - 10 - 12 per ovary
  - THICK STROMA
  - Ovary is 2 - 5 times larger than normal





Ring of pearl appearance



Shedding of Endometrium is Due to Ischemic Withdrawal in PCOS

HIRSUITISM & ↑ Serum Testosterone & Androstenedeone 00:16:48

- d/t Hyperandrogenism
- Androgen → Estrogens [Irreversible Reaction]
- ↑ ESTROGEN

  ↓

  ↓ FSH & ↑ LH
- LH: FSH → 1:1 Normal

  → 3:1 > 2:1 in PCOD

- LH → Stroma → Androgens → Normal
- ↑LH Thick Stroma → ↑ Androgens → Hirsutism

○ ↑ Androgen → ↑ Serum Testosterone

↑ Androgen → ↑ Serum Androstenodione

↓

↓ Sex Hormone Binding Globulins

↓

↑ Free ANDROGENS

↓

HIRSUTISM

INSULIN RESISTANCE 00:26:24

- Less glucose in ovary

  ↓

  Less energy

  ↓

  Follicles do not grow

- ↑ Serum insulin
- Obesity $\alpha$ IR
- Dark
  Shiny
  Velvety
  Crural Deposits } ACANTHOSIS NIGRICANS
  - Cutaneous marker of Insulin Resistance

- HA IR AN Syndrome 00:30:12
  HA → Hyper Androgenesim
  IR → Insulin Resistance
  AN → Acanthosis Nigricans

- METABOLIC SYNDROME

- Waist → ≥ 35 inches [> 89 cm]
- Tri Glycerides → > 150 mg/dl
- HDL → < 50 mg/dl
- BP → > 130/85 mm Hg
- Fasting glucose → 110-126
- 75 gms OGTT 2 hr values → > 140-199

- Atleast 3 or more → metabolic syndrome

TREATMENT

ANOVULATION TREATMENT 00:33:52

- ↓ Weight → Ovulation [in 30% cases]
- Insullin senstizer [metformin] → Ovulate [in 30% cases]
- CLOMIPHENE CITRATE → Ovulate [in 80% cases]
  → Pregnant [in 40% cases]

- Inj Recombinant FSH
- Inj Human Gonadotropins
- Aromatase Inhibitors → LETROZOLE [1st line Drug]

IRREGULAR CYCLES TREATMENT 00:40:55

- COMBINED ORAL CONTRACEPTIVE PILLS

- PROGESTERONE ONLY PILLS

For 10 days [From 14th day/mid cycle]

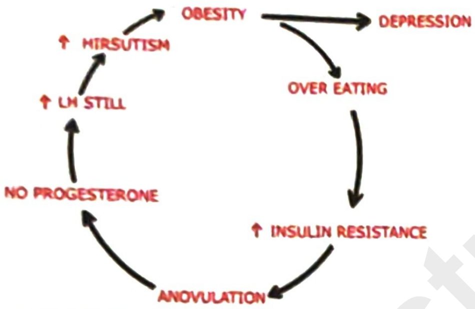
For 5 days [From 20th days]

HIRSUTISM TREATMENT 00:45:08

1 ANTI ANDROGENS

- CYPROTERONE ACETATE
- FINASTERIDE
- FLUTAMIDE
- SPIRANOLACTONE [1st line Drug]

2 COSMETIC TREATMENT For hair → Prevents Depression



15 – 20% Women in world have PCOS (1 in 5 females)

MC endocrinological disorder of reproductive age group → PCOS

MC cause of Hirsutism → PCOS

ROTTERDAM /ESHRE/ANDROGEN EXCESS SOCIETY/ASRM CRITERIA

DIAGNOSTIC REQUISTIES → Any 2 of the 3 00:51:32

1 Anovulation

2 Hyperandrogenesim → Clinical / Lab

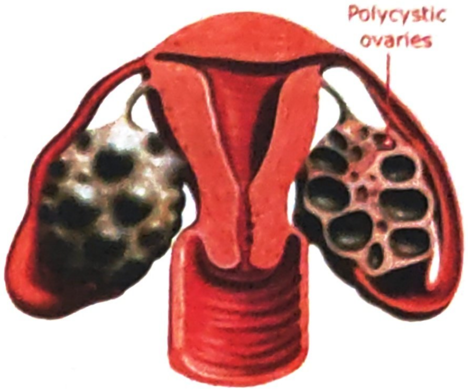
3 +/- PCO Look on USG

SURGICAL TREATMENT 00:54:50

1 LAPAROSCOPIC OVARIAN DRILLING

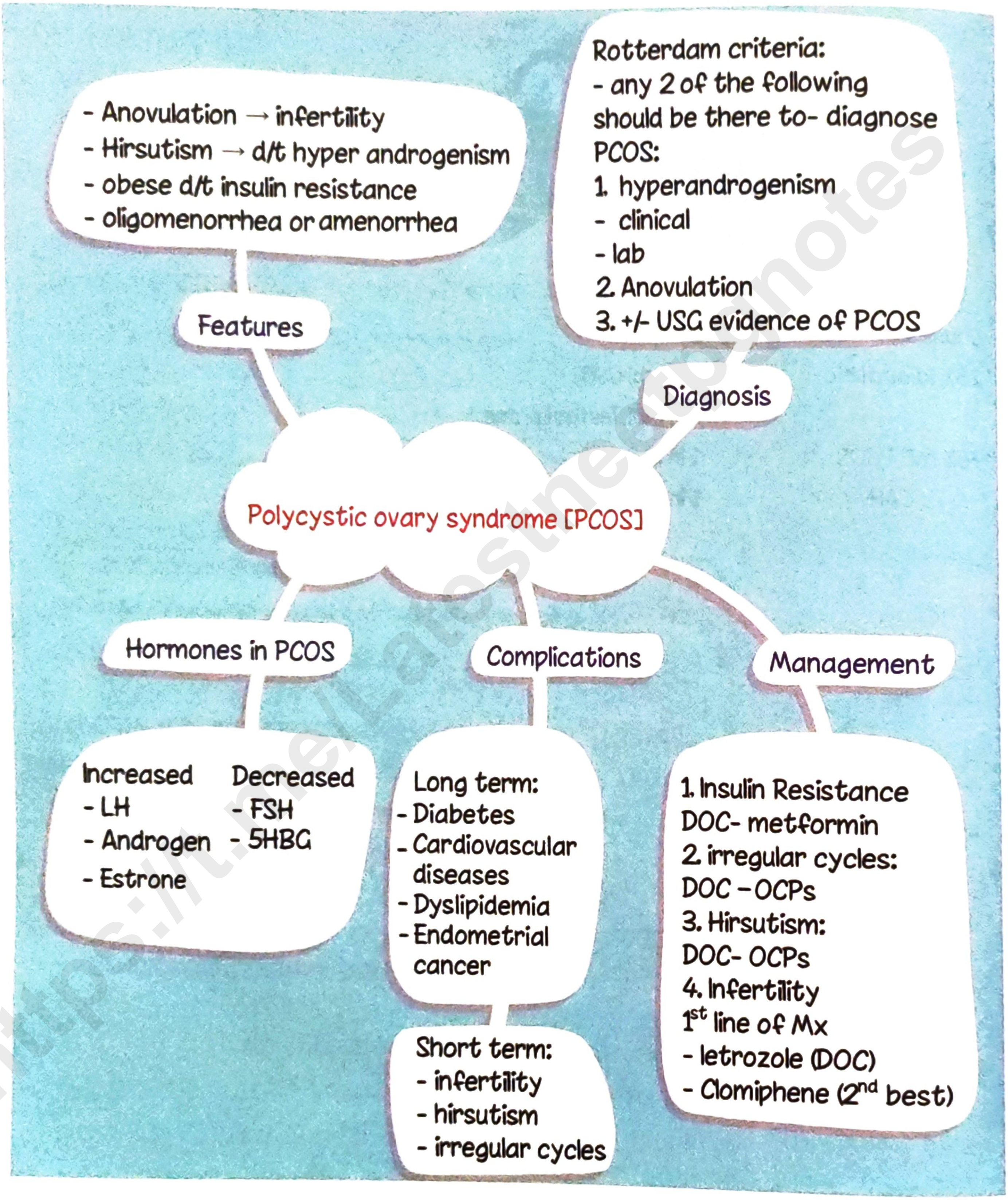
**LAPAROSCOPIC OVARIAN DRILLING**

- THICK STROMA → ↑ Local Androgens → Harder Follicles
- Purpose → ↓ Androgenic stroma → Better Follicular growth



Causes of HIRSUTISM

25% idiopathic → Normal USG
→ Normal Testosterone
75% MC PCOS → 1 in 5
CAH → 1 in 10,000



Polycystic ovary syndrome [PCOS]

Features

- Anovulation → infertility
- Hirsutism → d/t hyper androgenism
- obese d/t insulin resistance
- oligomenorrhea or amenorrhea

Diagnosis

Rotterdam criteria:
- any 2 of the following should be there to- diagnose PCOS:

1. hyperandrogenism
   - clinical
   - lab
2. Anovulation
3. +/- USG evidence of PCOS

Hormones in PCOS

| Increased | Decreased |
|---|---|
| - LH | - FSH |
| - Androgen | - SHBG |
| - Estrone | |

Complications

Long term:
- Diabetes
- Cardiovascular diseases
- Dyslipidemia
- Endometrial cancer

Short term:
- infertility
- hirsutism
- irregular cycles

Management

1. Insulin Resistance
DOC- metformin
2. irregular cycles:
DOC – OCPs
3. Hirsutism:
DOC- OCPs
4. Infertility
1st line of Mx
- letrozole (DOC)
- Clomiphene (2nd best)

# Chapter 9

# CERVICAL CARCINOMA

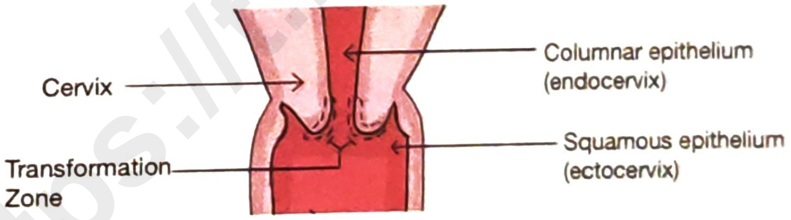
## CERVICAL CARCINOMA

- MC cancer of women in India → Ca Cervix
- HPV infection ~ 99%

## SCREENING 00:01:08

- PAP SMEAR
  - by Ayre's spatula
  - Sensitivity → 47 to 62%
  - Incidence of Ca Cervix ↓ by 75 – 80% & death ↓ by 70%
  - Cytobrush } ↑ Sensitivity upto 90% 00:04:58
    Cytobroom } Drying artefacts prevented
  - Place on a slide → Fixed by 95% alcohol
  - k/a Liquid based cytology

- SITE 00:08:28


Cervix
Transformation Zone
Columnar epithelium (endocervix)
Squamous epithelium (ectocervix)

- Transformation zone (squamo-columnar junction]
- Endometrium → columnar
- Vagina & cervix → squamous
- TZ is more prone to infections as the cells are continuously dividing here.

## ETIOLOGY

00:12:30

- HPV
  - 16 → MC
    Elaborate $E_6$, $E_7$ onco-proteins
  - 18 → Most malignant
- HIV 1 & 2
- HSV 1 & 2
- Commercial sex worker
- Women with many partners
- Partner with STD
- Multiparous
- Immuno compromised
- Low socio Economic status
- Smokers
- Early intercourse [<16 yrs]

TZ located at 1.7 to 2.3 cm from the external Os changes location with age group

- Post partum/ puerperal time

❖ HPV infection is self limiting (in most cases) in 9-15 months.

### TIME TO DO PAP SMEAR

00:19:13

- Any woman > 21yrs of age
  (Any women 3 yrs after 1st sexual exposure, in India)
- From 21 to 29 years, sexually active women should have cytology every 3 years
- From 30-65 yrs: Co-TEST [PAP + HPV] : if negative then 5 yearly
- If only cytology done, then once in 3 years if cytology is negative
- After 65 yrs: No more PAP, if 3 cytology are negative or 2 Co-TEST are negative

00:24:13

| DYSPLASIA CLASSIFICATION | | BETHESDA CLASSIFICATION |
|---|---|---|
| CIN I | → < 1/3rd abnormal | → LOW GRADE S.I.E. LESION |
| CIN II | → > 1/3rd to <2/3rd abnormal | HIGH GRADE LESION |
| CIN III | → > 2/3rd abnormal | |
| CIS | → All cells are abnormal | |

## MANAGEMENT

- CIN I MANAGEMENT

00:28:18

  - CIN I $\xrightarrow{5\ yrs}$ CIN III $\xrightarrow{10\ yrs}$ Ca CERVIX
  - CIN I not a precursor of Ca CERVIX
  - 6 monthly PAP smear
  - Antivirals & antibiotics given
  - HPV DNA is done
  - CIN I & CIN II → 65-80% regress spontaneously
    → High grade and precursor of Ca Cervix
  - CIN I > 2 yrs → Continue surveillance
    → Ablation/ Rx

CIN II & CIN III

- CIN III MANAGEMENT

00:30:36

  - Conization not done
  - Problem with conization:
    - Short Cx → incompetence → abortions
    - Stenosed Cx → Infertility
  - Can be done if colposcopic Biopsy is inconclusive
  - COLPOSCOPIC [Vagino Scopic] BIOPSY DONE
  - Acetic acid used

    ↓

    Coagulate the proteins → Make the rapidly dividing areas ACETOWHITE

    Biopsy is taken from ACETOWHITE areas
  - Schiller iodine [LUGOL IODINE] can be used

↓

Stains the glycogen rich areas → MAHOGANY BROWN

Biopsy taken from Unstained Areas

- VIAA → Visual Inspection under Acetic Acid
- VILI → Visual inspection under lugol's iodineAlso done

RESULTS OF COLPOSCOPIC BIOPSY

1. Invasive cancer Cx → Rx by Radical hysterectomy
2. Biopsy proven CIN III → Rx by LLETZ [LEEP]
   (Cells not invading stroma)
   - LLETZ - Large Loop Excision Transmission Zone } Best
   - LEEP - Loop Electro surgical Excision Procedure } Rx

Rx LASER CONIZATION

- Expensive & difficult
- Sx Conization (If > 35 yrs)
- Hysterectomy (If > 40 yrs)
- Cryocautery
- Laser ablation → required training & experience

SYMPTOMS OF Ca CERVIX 00:52:12

- Abnormal bleeding
  - Post coital bleeding [mc] (In newly Married PCB @ Posterior Vaginal Wall)
- Foul smelling discharge
- Pyometra → Dirty vaginal discharge
- Post menopausal bleeding
- Cancer cachexia
- Cancer pain
- Uremic symptoms

Mx of Post Coital Bleeding

Local examination → Cervix looks Normal

↓

Indications for colposcopy biopsy

↓

- CIN III [cervical intra epithelial neoplasia]
- CIS [carcinoma in situ]
- AIS (Adeno Ca) → Hysterectomy
- VIN III → Superficial excision/ laser ablation

STAGING 01:04:47

CLINICAL STAGING DONE WITH

- P/ Speculum examination
- P/ Vaginal examination
- P/ Rectal examination [for parametrium]
- Cystoscopy [for bladder]
- Procto sigmoidoscopy

USG
CT
MRI
PET CT

STAGE

I → Limited to Cervix
IA → Microscopic Cancer
$A_1$ → < 3 mm depth
$A_2$ → 3-5 mm depth
} Transverse Spread < 7 mm → ⊗ Removed
IB → Clinical/ macroscopic
$B_1$ → < 2 cm
$B_2$ → 2 – 4 cm
$B_3$ → > 4 cm

STAGE

IIA → Upper Vagina Involved (II $A_1$ → < 4 cm ; II $A_2$ → > 4 cm)
IIB → Parametrial involvement but short of pelvic side wall

STAGE

IIIA → Lower 1/3rd vaginal involvement
IIIB → Parametrial involvement till the pelvic side wall
[Hydronephrosis +]

MC Stage of Ca cervix presentation in India → STAGE III B

STAGE

III $C_1$ → Pelvic lymphnodes involved } Imaging [PET CT / MRI

$C_2$ → Para Aortic lymphnodes involved } /USG] required

STAGE

IVA → Bladder & Bowel Involvement

IVB → Distant Metastasis

- Cervix doesn't drain into inguinal group of lymph nodes (Inguinal group of lymph nodes are not involved)
- Cervix cancer spreading to endometrium does not change staging
- Anterior lip MC involved

TREATMENT 01:21:12

For all stages → Radiotherapy is good

Stage I – $IIA_1$ → Surgical Hysterectomy

Stage >$IIA_2$ → Chemo Radiation

Management of Ca cervix

| | | |
|---|---|---|
| IA1 | <3 mm NO LVSI<br><3 mm with LVSI | Conization or Extrafascial Hysterectomy<br>Radical Trachelectomy<br>Or Radical Hysterectomy + Pelvic LAD<br>Or SLN (External Illiac, obturator) |
| IA 2 | >3 mm <5 mm | Same |
| IB1 | >5 mm <2 cm | Same |
| IB 2 | >2 cm <4 cm | Radical Hysterectomy + Pelvic LAD |
| IB 3 | >4 cm | Chemoradiation |
| IIA 1 | <4 cm + upper vagina | Radical Hysterectomy + Pelvic LAD or Chemoradiation |
| IIA 2 | >4 cm + upper vagina | Chemoradiation |

## Maximum Radiation Given At

### POINT A

- 2 cm above & 2cm lateral to external os
- Ureter crosses the uterine artery [bridge over water]
  Here uterus is under the uterine artery
- Parametrium seen here
- Upto 7500 to 8000 RADs given here

### POINT B

- 3 cm lateral point A
- Obturator lymph nodes at the pelvic side walls
  Obturator LN → Sentinel group of LN
- Upto 6000 RADs given here

## HISTOPATHOLOGY

01:34:46

- Squamous cell carcinoma
  - Large cell Keratinising variant [mc]
  - Large cell Non Keratinising variant
  - Small cell variant
- MC cause death in CA cervix → Uremia
- 2nd mc cause of death → Haemorrhage
- 3rd mc cause of death → Infection

## VACCINES

00:36:50

HPV

- CERVARIX
  - Bivalent 16, 18
- GARDASIL
  - Quadrivalent
    6, 11, 16, 18
  - Nono valent vaccine
    6, 11, 16, 18, 31, 33, 45, 52, 58

**HPV Schedule**

0 day

2 months

6 months

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- Chance of prevention if given before exposure → upto 90%
- Chance of prevention if given after exposure → upto 40%
- Given after 9 yrs, upto 45 yrs (all women)
- All serotypes are not covered, so continue screening protocol

Cervical carcinoma in pregnancy

All pregnant women – pap smear

↓

Malignant cells positive

↓

Conization done

(› 12wks → abortion reduces)

If Ca Cx → Diagnosed

IA → Go till term → C.S → RAD HYST + LAD

IB → Fetal lung maturity:

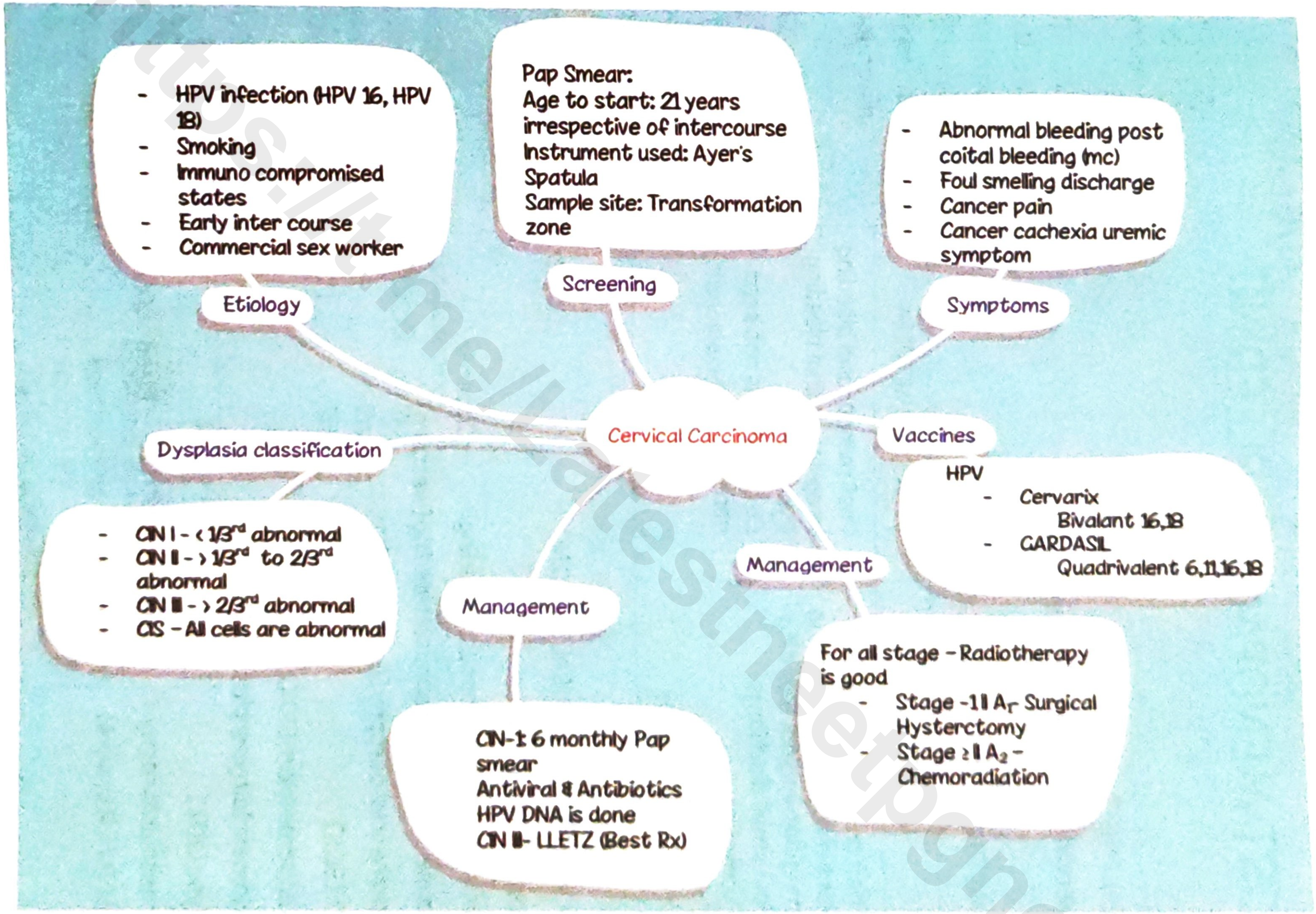
› 28 wks
32 wks (wait max 4 wk) } C.S + RAD HYST + LAD

II – IV → Radiotherapy

Beyond 28 wks → C.S → Radiotherapy

First Trimester → Radiotherapy (Baby will abort)

Second Trimester → Try to see Viability



Cervical Carcinoma

**Etiology**

- HPV infection (HPV 16, HPV 18)
- Smoking
- Immuno compromised states
- Early inter course
- Commercial sex worker

**Screening**

Pap Smear:
Age to start: 21 years irrespective of intercourse
Instrument used: Ayer's Spatula
Sample site: Transformation zone

**Symptoms**

- Abnormal bleeding post coital bleeding (mc)
- Foul smelling discharge
- Cancer pain
- Cancer cachexia uremic symptom

**Dysplasia classification**

- CIN I - < 1/3rd abnormal
- CIN II - > 1/3rd to 2/3rd abnormal
- CIN III - > 2/3rd abnormal
- CIS - All cells are abnormal

**Vaccines**

HPV
- Cervarix
    - Bivalant 16,18
- GARDASIL
    - Quadrivalent 6,11,16,18

**Management**

CIN-1: 6 monthly Pap smear
Antiviral & Antibiotics
HPV DNA is done
CIN III- LLETZ (Best Rx)

**Management**

For all stage - Radiotherapy is good
- Stage -1 II $A_1$- Surgical Hysterctomy
- Stage ≥ II $A_2$ - Chemoradiation

## Chapter 10

# POST MENOPAUSAL BLEEDING

### POST MENOPAUSAL BLEEDING 00:00:20

- Any bleeding after 1 year of menopause

### SYMPTOMS OF CA CERVIX & CA ENDOMETRIUM 00:01:16

| CA CERVIX | CA ENDOMETRIUM |
|---|---|
| - Post coital bleeding (MC)<br>- Post menopausal bleeding<br>- Irregular vaginal Bleeding<br>- Foul smell discharge<br>- Pyometra<br>- Cancer cachexia<br>- Uremia, pelvic pain | - Post menopausal bleeding<br>- Irregular vaginal bleeding<br>- Pyometra<br>- Ca cachexia is not seen here |

### CAUSES OF POST MENOPAUSAL BLEEDING 00:05:11

- MC cause in India → Ca cervix
- MC cause of post menopausal bleeding → Ca cervix
- MC cause of post menopausal bleeding [western]
  - Endometrial atrophy [60-80%(MC)]
  - HRT [30%]
  - CA endometrium [10%]
  - Endometrial hyperplasia [10%]
  - polyps [10%]

Endometrial Atrophy → Senile Endometritis → Bleed 00:12:58

MCC of P.M.B in world → Ca Cervix

## Chapter 11

# VULVAR CARCINOMA

→ Age group → approximate 65 yrs

### PRESENTATION 00:00:49

- → Pruritis (MC)
- → Mass in perineum
- → lump in perineum
- → Cancer cachexia
- → Cancer pain

### PREDISPOSING FACTORS 00:01:36

- → HPV 6 (MC)
- → VIN [Vulval intra epithelial neoplasia]
- → CIN
- → Lichen sclerosis
- → Alcohol
- → Immuno suppressants
- → Squamous hyperplasia

### TYPES (Based on Etiology & Histopathology) 00:03:22

- → Squamous cell carcinoma [92%] → mc
- → Melanoma [2-4%] → 2nd mc
- → Basal cell carcinoma [2-3%] → 3rd mc

### SQUAMOUS CELL CARCINOMA

| BASALOID [WARTY] | KERATINIZING |
|---|---|
| - Younger age group | - older age group |
| - Multifocal lesions | - Unifocal lesions |
| - Predisposing factors | - Predisposing factors |
| HPV | No a/w HPV |
| VIN | a/w lichen sclerosis |
| Smoking/ Alcohol | a/w squamous hyperplasia |

## 5 YEAR SURVIAL

- → Ca vulva without Inguino femoral LN involvement → > 90%
- → Ca vulva with Inguino femoral LN involvement → ≤ 50%
- → Groin recurrence → POOR PROGNOSIS

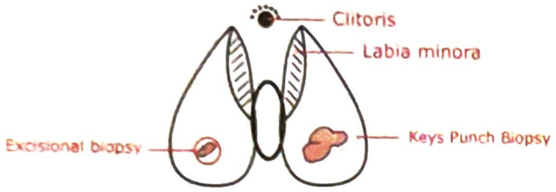
## DIAGNOSIS

00:07:58

- Labia majora involved in 60% cases
- Clitoris involved in 15% cases
- If lesion is

≤1cm → Excisional biopsy
>1 cm → Keys punch biopsy

KEYS PUNCH



## STAGING

00:10:10

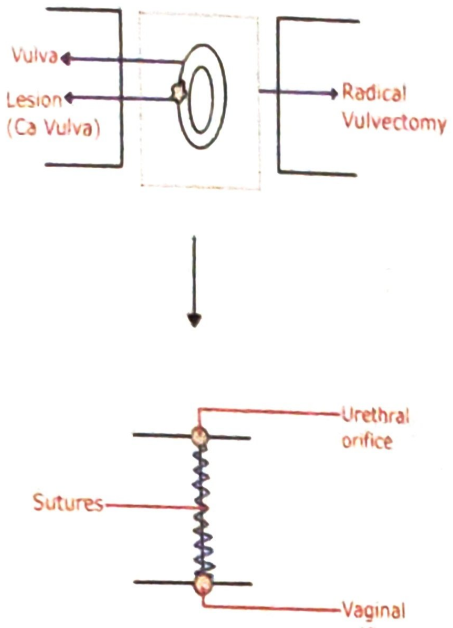
| | | |
|---|---|---|
| STAGE I | Limited to Vulva | |
| | I A<br>I B | Size → < 2 cm, invasion < 1mm<br>Size → > 2 cm, invasion > 1mm |
| STAGE II | Adjacent organ involvement | |
| | Lower 1/3 rd of Vagina<br>Lower 1/3 rd of Urethra<br>Anus | |
| STAGE III | Inguino femoral LN involvement | |
| | III Ai<br>Aii | One LN → > 5 mm<br>One or two LN → < 5 mm |
| | III Bi<br>Bii | Two LN → > 5 mm<br>More than 3 LN → < 5 mm |
| | III C | LN involvement⊕, with extra capsular spread |
| STAGE IV | | |
| | IV Ai<br>Aii | Upper Urethra, upper Vagina, Rectal involvement, growth stuck to pelvic bone<br>Fixed or ulcerated LN |
| | IV B | Distant metastasis<br>Pelvic LN |

Staging of all cancers in gynae done surgically except Ca cervix which is done clinically

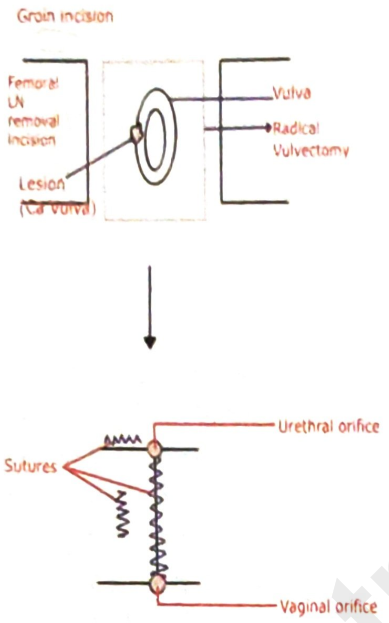
→Stage I }
Stage II } No LN Involvement

Treatment 00:15:33

| | | |
|---|---|---|
| STAGE I A | Limited to Vulva<br>Size < 2cms,<br>Invasion < 1mm | Wide Local Incision + Sentinel Lymph Node Biopsy<br>• Sentinel LN Biopsy<br>- If negative →Radical Vulvectomy alone<br>- If positive →Radical Vulvectomy + LN removal |
| STAGE I B | Size > 2 cms<br>Invasion < 1mm | Radical Local Excision +<br>Central Lesion: B/L LAD<br>Lateral Lesion: U/L LAD<br>(Lesions > 2 cm from midline are lateral lesions) |
| STAGE II | Any size: Spread to Lower 1/3 Urethra, Lower 1/3 Vagina, Anus | Radical Vulvectomy Plus B/L LAD |
| STAGE III | Inguino-Femoral LN positive | Radiation + Surgery + LAD |
| STAGE IV | IV A: Upper Urethra, Upper Vagina, Bladder, Rectum Pelvic side wall<br>IV B: Distant Metastasis Pelvic LN | Radiation + Surgery + LAD |



**Radical Vulvectomy**



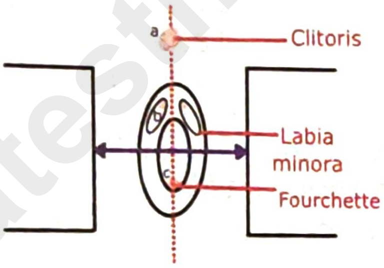
**Radical Vulvectomy+ Lymphadenectomy**

*Central Lesions involves

a Clitoris

b Anterior part of labia minora

c Posterior fourchette



Chemotherapy for stage III & IV

Combinations of

- Bleomycin
- Methotrexate
- Lomustine

Or

- Bleomycin
- Mitomycin C

# Chapter 12

# FIBROIDS

## FIBROIDS 00:00:17

- Monoclonal tumors
- Pseudo capsule may be present
- Whorls of smooth muscles always starts in intramural area

↓

- On contraction, uterus Pushes Fibroid either submucosal or subserosal

## ETIOLOGY & ASSOCIATION 00:01:55

- Incidence
- 30% of women
- ›50 yrs → 80%

- 2.5 times of more chance if female relative has one fibroid
- a/w chromosomal abnormality [40%]
  - 12-14 Translocation
  - 12 Trisomy
  - 7 deletion

- Obese women
- red meat eater
- nulliparous women
- Estrogen & progesterones
- Growth Factors
  - Transforming growth Factor β
  - Platelet derived growth Factor
  - Epidermal growth Factor

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## CLINICAL FEATURES

### SYMPTOMS

00:05:24

- PAIN
  - d/t:
    contraction
    compression
    compaction
    degeneration
- Infertility
  - d/t:
    compression
    FB action

- BLEEDING
  - d/t:
    ↑ endometrial recruitment
    poor contractility
    ↑Vasodilator Prostaglandins
- Bowel & Bladder Symptoms
  - d/t:
    Frequency (MC)
    Retention of urine also present

### DIAGNOSIS

00:10:34

- USG → also used for mapping of fibroids
- MRI [Best]

### Rx of Fibroids

00:11:28

- Small [< 5 cm] with no pain / bleeding /infertility → No Rx required
- Small [< 5cm] with pain / bleeding /infertility → Rx given
- Large [> 10cm] →Rx given
- Large [> 10cm] No pain/ bleeding /infertility →Rx given
- Larger the Fibroid more are the → DEGENERATIVE CHANGES
  - Hyaline degeneration
  - Red degeneration
    (Seen in pregnancy, starts in 2nd trimster mostly conservative Rx. Never operate in pregnancy)
  - Lipoid degeneration
  - Calcific degeneration → WOMB STONE
  - Sarcomatous degeneration [<0.5%, rarest degeneration]
  - If elderly woman → Hysterectomy

### MEDICAL MANAGEMENT

00:15:55

- to ↓ Bleeding
- to ↓ Size
- young women with no children

- NSAIDS
- GnRH Analouges [by Depot Form →Down regulates pituitary]

- GnRH Antagonists [CETROTIDE]
- MIFEPRISTONE → antiprogestin → ↓ Size
- PROGESTERONE [IUCD Levonorgestrol] → ↓ Bleeding

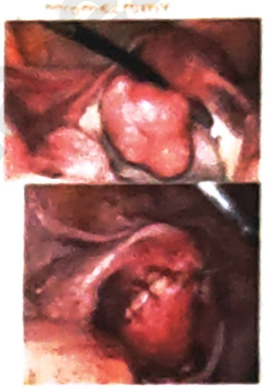
## NEW TECHNIQUES 00:18:47

- UTERINE ARTERY EMBOLIZATION
  - uses Poly Vinyl Alcohol particles
  - Upto 80% reduction in pain & bleeding

- HIGH FREQUENCY USG
  - HiFU → High Frequency Focused USG
  - MRGFUS → MR Guided Focused USG

## SURGICAL MANAGEMENT OF FIBROIDS 00:21:47

### PRE REQUISITES



- Hb → › 10 gm%
- arrange blood
- minimize the incision on the uterus

  Avoid posterior wall incision [S/E → Retroversion]
- Intraoperlise [Retroverted uterus can cause infertility]
- Techniques to ↓ blood loss
  - torniquet usage
  - vasopressin usage (Pitras in infections)

- Reduce handling of fallopian tube
- Semen Analysis → don't operate the woman without semen analysis of her husband (fibroid in pregnancy not to be touched)

- FIBROID IN PREGNANCY → Rx is CONSERVATIVE
- in younger women → MYOMECTOMY

- in older women → HYSTERECTOMY

## FIGO CLASSIFICATION 00:35:56

### LEIOMYOMA SUBCLASSIFICATION SYSTEM

Submucosal

0 Pedunculated intracavitary

1 <50% intramural

2 50% intramural

Other

3 Contacts ednometrium 100% intramural

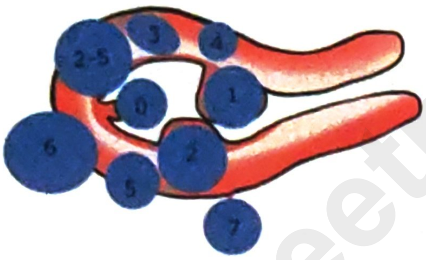
4 Intramural

5 Subserosal ≥ 50% intramural

6 Subserosal < 50 % intramural

7 Subserosal pedunculated

8 Other (Specify e.g., cervical parasitic)



- based on location no. have been assigned to the fibroids
- if a fibroid is impinging on 2 locations at once, then the mucosal location should be mentioned First f/b serosal location

MYOMECTOMY (if fibroid is within the uterine cavity)

## HYSTEROSCOPIC MYOMECTOMY 00:40:32

- indicated for Type 0, Type 1 fibroids [some surgeons do it for Type II Fibroids]
- Size should be < 3 cm
- The Fibroid is < 50% intramural

- The FLUID which distends the uterus have different criteria

- DEFICIT OF MEDIA TO BE CONSIDERED:-

| | WARNED | STOP SURGERY |
|---|---|---|
| NON ELECTROLYTE<br>Glycine | If deficit of<br>500-750 ml | 1500 ml |
| ELECTROLYTE MEDIA<br>Saline | 1000 ml | 2500 ml |

Unipolar current can't be used with electrolyte media (saline)

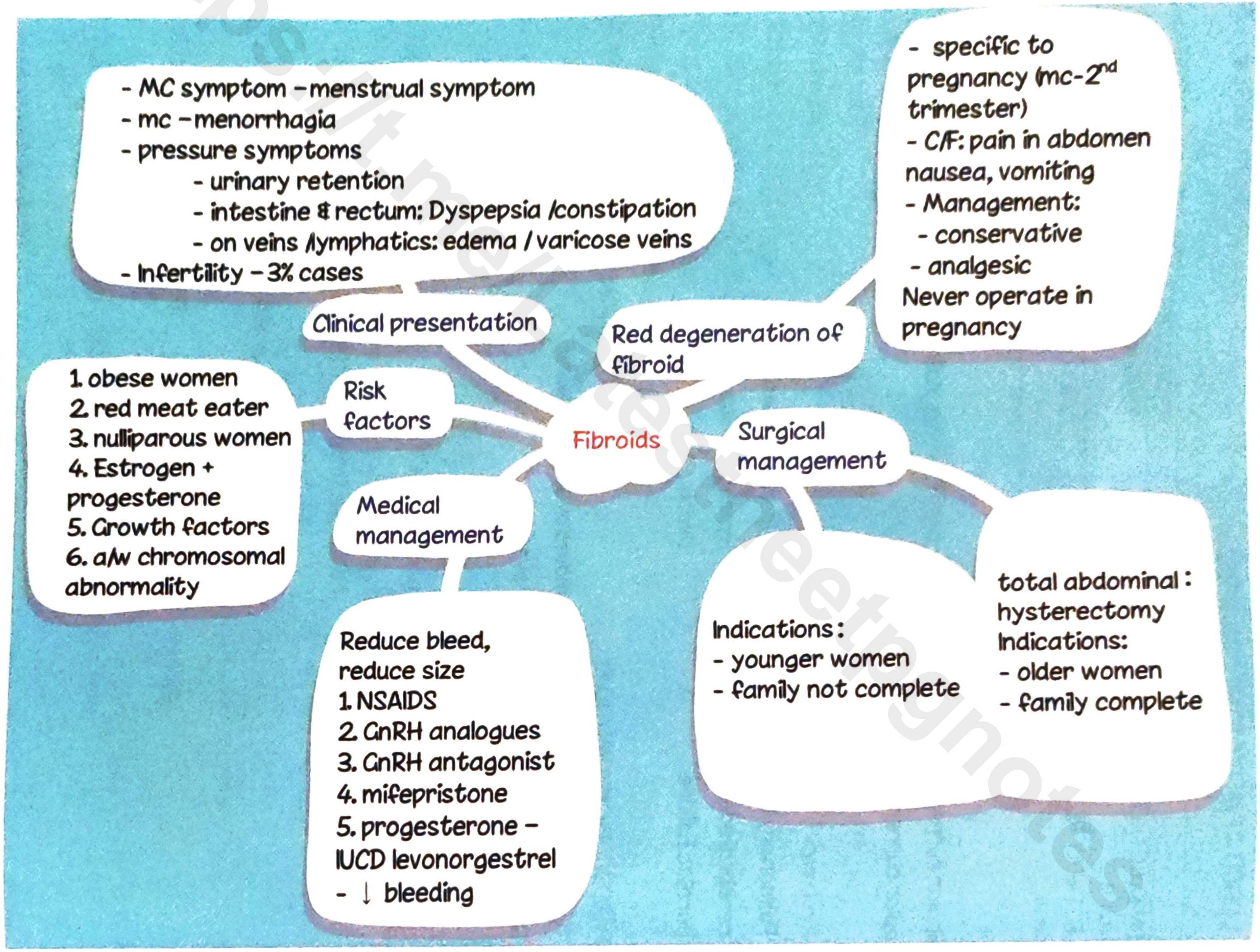
(bipolar current can be used)

- Problems of excess of fluid in the body
- Pulmonary Edema
- cerebral edema
- cardiac Failure
- Hyperammonemia
- Hyponatremia
- Death

## LAPAROSCOPIC MYOMECTOMY 00:49:59

- Type 5, 6, 7 Fibroids are easily removed by this procedure
- Subserous Fibroids are easily removed

- CRITERIA
- 3-4 Fibroids of 5 cm Size or lesser
- 1 Fibroid of 15 cm or smaller



**Fibroids**

**Clinical presentation**

- MC symptom – menstrual symptom
- mc – menorrhagia
- pressure symptoms
  - urinary retention
  - intestine & rectum: Dyspepsia /constipation
  - on veins /lymphatics: edema / varicose veins
- Infertility – 3% cases

**Risk factors**

1. obese women
2. red meat eater
3. nulliparous women
4. Estrogen + progesterone
5. Growth factors
6. a/w chromosomal abnormality

**Medical management**

Reduce bleed, reduce size
1. NSAIDS
2. GnRH analogues
3. GnRH antagonist
4. mifepristone
5. progesterone – IUCD levonorgestrel
   - ↓ bleeding

**Red degeneration of fibroid**

- specific to pregnancy (mc-2nd trimester)
- C/F: pain in abdomen nausea, vomiting
- Management:
  - conservative
  - analgesic

Never operate in pregnancy

**Surgical management**

Indications:
- younger women
- family not complete

total abdominal : hysterectomy
Indications:
- older women
- family complete

# Chapter 13

# HYSTERECTOMY

## HYSTERECTOMY

### CLASSIFICATION

00:00:37

- Total
- Subtotal
- Abdominal
- Vaginal
- With or without B/L Salpingo Oophorectomy
- With or without U/L Salpingo Oophorectomy
- Emergency
- Planned
- Obstetric indication
- Gynecological indications
- Laparoscopic
- Open
- robotic

### INDICATIONS

00:04:38

- Fibroid uterus [40-45%] [mc]
- Endometriosis [15-20%]
- Prolapse [15%]
- Dysfunctional uterine bleeding
- Pelvic inflammatory Disease
- Chronic Pelvic Pain

### PRE-REQUISITES

00:05:44

- Consent
- rule out pregnancy
- Pap smear examination

- arrange blood
- Precautious measures For Venous thrombo embolism
- INDUCTIVE Antibiotics [with in 1 hr]

COMPLICATIONS 00:08:03

INTRA OP INJURIES to Bowel, Bladder & vessels

URETER INJURY

- in a hysterectomy, mc site of injury → at the site of Crossing the Uterine artery
- Overall, mc site of injury → at the Pelvic Brim

POST OP COMPLICATIONS

HEMORRHAGE

- Immediate → visualized

  If retroperitoneal [Look for signs- ↑ PR, Shock]
- Reactionary → in 1st 24hrs d/t slippage of ligature
- Secondary → > 24 hrs uptill 2-3 weeks d/t infections

WOUND INFECTIONS [4-6 % cases]

CUFF/ VAULT CEILULITIS [vaginal cuff]

URINARY RETENTION – d/t bladder hypotonia

URETERIC INJURY

- Post op Flank pain
- do USG/CT for Dx
- do cystoscopy to localise the block

BLADDER INJURY

- vesico vaginal Fistula
- Uretero vaginal fistula

PROLAPSE OF FALLOPIAN TUBE through the vault

CUFF DEHISCENCE

- advise not to have intercourse for 6 weeks

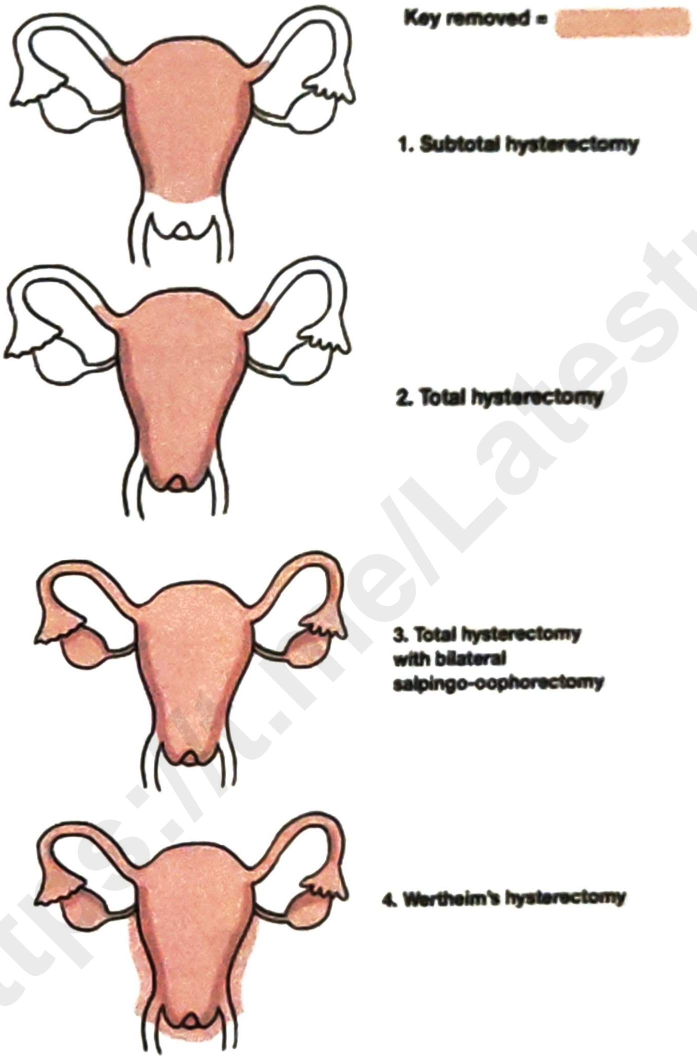
## LAPAROSCOPIC HYSTERECTOMY

00:20:14

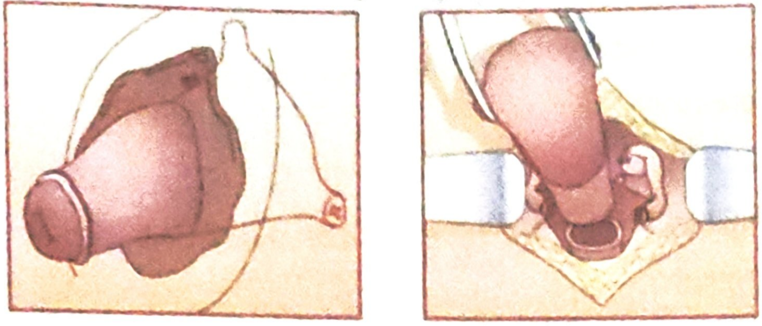
1 LAVH [Laparoscpic Assisted vaginal Hysterectomy]
- Diagnostic laparoscopy +Vaginal Hysterectomy
- Adhesiolysis + Vaginal Hysterectomy
- Resection of Adnexae
- Uterus is Resected after bladder mobilization

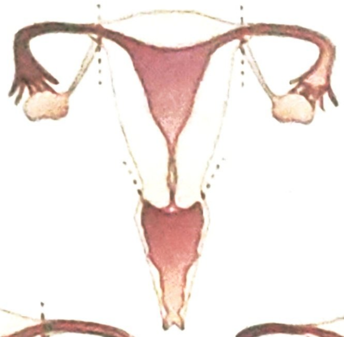
2 Total Laparoscopic Hysterectomy METHODS

### TYPES OF HYSTERECTOMY

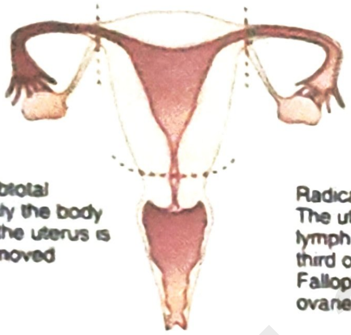

Key removed = 
1. Subtotal hysterectomy
2. Total hysterectomy
3. Total hysterectomy with bilateral salpingo-oophorectomy
4. Wertheim's hysterectomy

A hysterectomy can be performed through the vagina or the abdomen

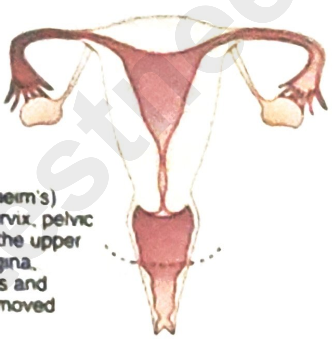




Total
The body of the uterus and the cervix are removed



Subtotal
Only the body of the uterus is removed



Radical (Wertheim's)
The uterus, cervix, pelvic lymph nodes, the upper third of the vagina, Fallopian tubes and ovaries are removed

- OVARIES 00:23:50

- Conserve ovaries at least till 50 yrs
- If Surgical oophorectomy done < 50 yrs, more chances of coronary Artery Disease by 65 yrs

PROPHYLACTIC OOPHORECTOMY 00:25:32

- BRCAI & BRCA II mutations
- $1^\circ$ Female relatives having CA Breast, CA ovary, CA ovary → 10-50% Risk

https://t.me/Latestpgnotes

# Chapter 14

# MULLERIAN ABNORMALITIES

## Embryological Development & It's Abnormalities

- Female internal genitalia derived from Mullerian/ Para Mesonephric Duct
- Male internal genitalia derived from Wolfian/ Mesonephric/ Gartner Duct

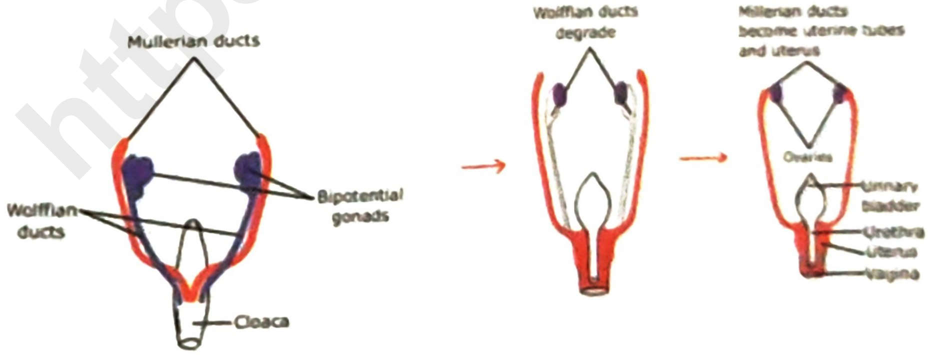
### MULLARIN DUCT DERIVATIVES 00:00:20

- Uterus
- Cervix
- Fallopian tubes
- 4/5th vagina
  - Lower 1/5th derived from UROGENITAL SINUS
  - Ovaries are derived from GENITAL RIDGE

### WOLFIAN DUCT DERIVATIVES 00:02:52

- Epididymus
- Vas deferens
- Seminiferous tubules
- Prostatic urethra

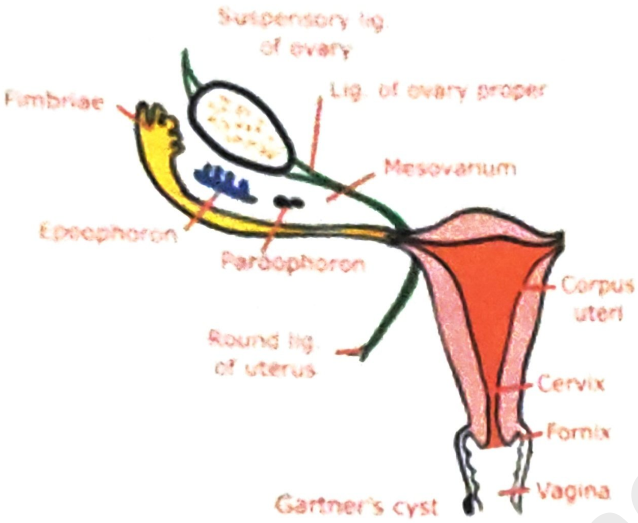
### FEMALE GENITAL TRACT DEVELOPMENT 00:03:23



## FATE OF WOLFIAN DUCT IN FEMALES

00:05:13

- Remenants of wolfian duct
  - Epoophoron → above the ovary
  - Paraoophoron → beside the ovary



- Obliterated male duct at upper lateral vaginal wall → may leads to

## GARTNER CYST

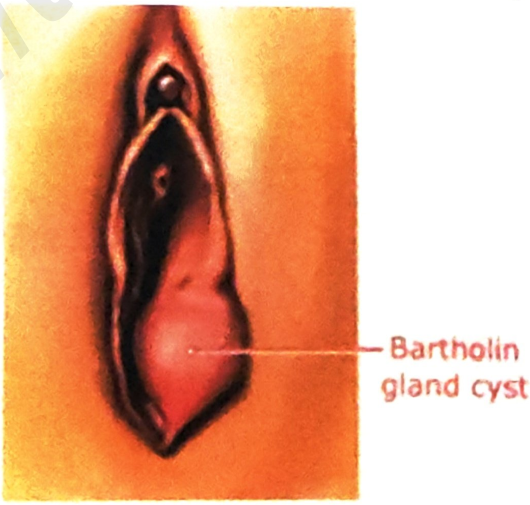
00:07:42

- Mostly asymptomatic
- Rx by SIMPLE EXCISION

## BARTHOLIN ABCESS

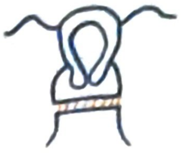
00:09:24

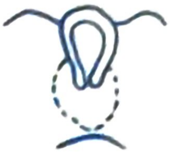
- Glands present at junction of anterior 2/3rd & posterior 1/3 rd of vulva
- Rx by MARSUPILIZATION [Exteriorization of cavity]

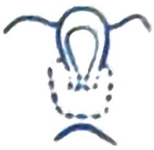


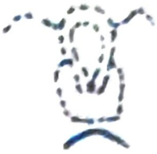
## MULLARIAN DUCT ANOMALIES

## VERTICAL FUSION DEFECTS 00:17:16


Transverse vaginal Septum

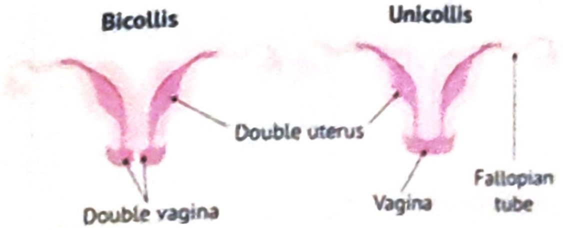

Vaginal Atresia


Cervical vaginal Atresia

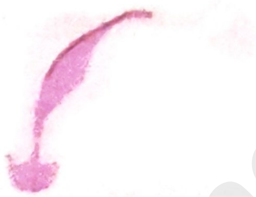

Complete mullerian Agenesis

## LATERAL FUSION DEFECTS 00:28:31

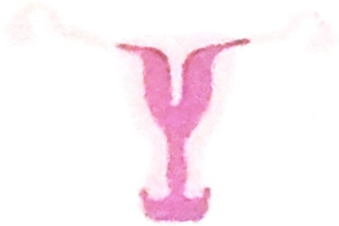
1 DIDELPHYS



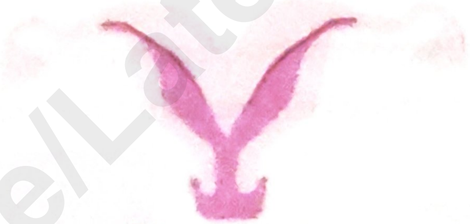
2 UNICORNUATE


Unicornuate

3 SEPTATE


Septate

4 BICORNUATE


Bicornuate

## SEPTATE VS BICORNUATE UTERUS 00:32:35

- On Hysterosalpingography, both septate & bicornuate uterus looks similar
- Angle between 2 cavities
  - ‹90° [Acute] → Septate uterus
  - ›90° [Obtuse] → Bicornuate uterus
- Distance b/w 2 cavities
  - ‹4 cm → Septate uterus
  - ›4 cm → Bicornuate uterus

- Fundus
  - ○ Broad → septate uterus
  - ○ Indented / dimpling → Bicornuate uterus

### Septate Uterus is the Single Most Common Mullerian Defect

- Best way to distinguish b/w septate & bicornuate uterus
  - DIAGNOSTIC LAPAROSCOPY + HYTEROSCOPY
  - MRI [Best imaging method]

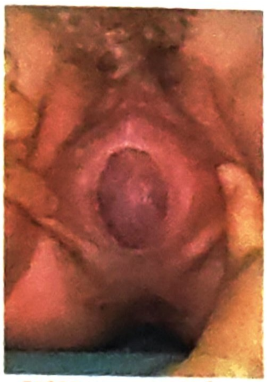
- TREATMENT
  - Septate uterus → removal of septum through hysteroscopy
  - Bicornuate → Unification surgery [STRASSMAN'S Or JONE'S METROPLASTY]

- Only indication of unifying the uterus in bicornuate uterus

→ Recurrent Abortions

### CRYPTOMENORRHEA

- Menstruation present [Hematometra-blood in uterus; Hematocolpos - blood in vagina] but menstrual blood not coming out
  - Transverse vaginal septum
  - Vaginal atresia
  - Cervical vaginal atresia
  - Imperforate hymen



IMPERFORATE HYMEN

### IMPERFORATE HYMEN

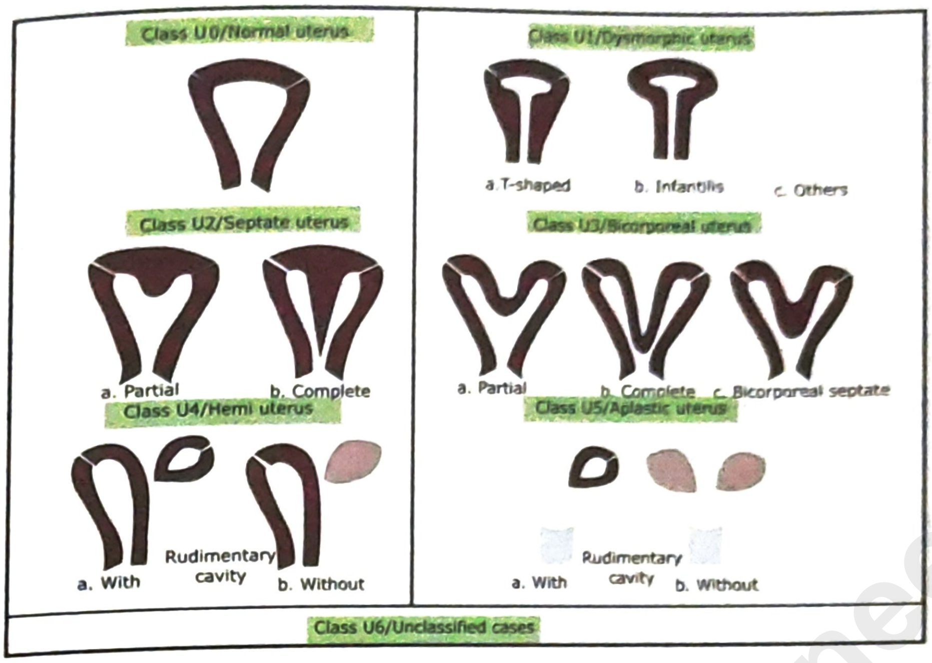
- Not a mullerian anomaly
- It is a cannulation defect
- Rx → 1. Cruciate incition given

  2. Cut along the incision

## ESHRE CLASSIFICATION

00:46:29

- European society for Human Reproduction & Embryology



## Chapter 15

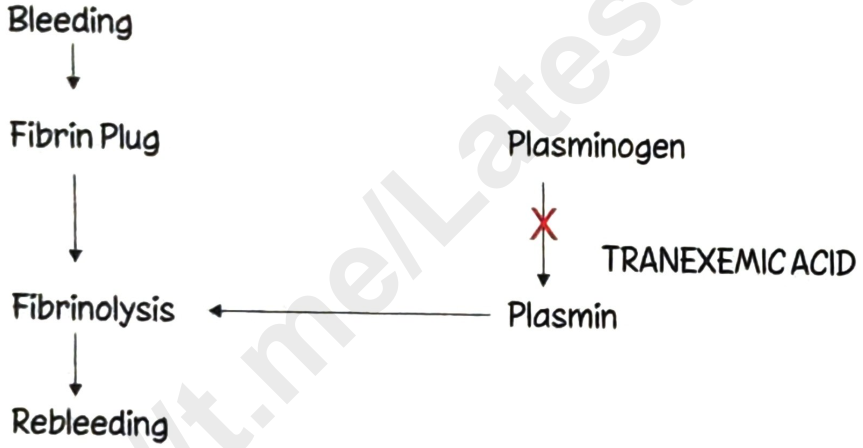
# ABNORMAL UTERINE BLEEDING

### ABNORMAL UTERINE BLEEDING 00:00:30

1. Medical Management 00:00:51

- NSAIDS
  - Inhibits vasodilator prostaglandins
  - ↓ Pain
    ↓ bleeding in uterine blood vessels
  - 1st Line drug

- TRANEXEMIC ACID
  - Bleeding



  - 1st Line drug

2. HORMONAL MANAGEMENT 00:03:57

- PROGESTERONE → Stabilizes the Endometrium
- ESTROGEN → Forms new endometrial glands

  Estrogen Withdrawal > Progesterone Withdrawal

- Combined Oral Contraceptive Pills
- Danazol/Androgens → Leads to Endometrial atrophy
- GnRH Analogues → down regulation of Pituitary
- IUCD LEVONORGESTROL [MIRENA]

### 3. SURGICAL MANAGEMENT 00:08:26

- Therapeutic Currettage/
  Hemostatic Currettage/
  Dilatation & Currettage [DNC]
- B/L UTERINE ARTERY EMBOLIZATION by PVA [poly vinyl Alcohol] Particles
- Trans cervical Resection of Endometrium [TCRE]
- MICRO WAVE METHOD
- THERMAL METHOD → 87°C x 8 min
- HYSTERECTOMY

### CAUSES 00:18:53

1. Tumors
2. Infections
3. Pregnancy related causes:

For Example:

- 28th JULY → Last menstrual Period

↓

11th August → Ovulated

(Intercourse) ↓

Embryo implanted on fallopian tube on 17th August

↓

28th August missed her period

↓

30th August bleeding occurs

- mc Fate of ectopic pregnancy → vascular inefficiency

↓

Embryo degeneration

↓

↓ Progesterone

↓

SHEDDING OF DECIDUA

- Other outcomes of ectopic pregnancy
  - ○ Tubal abortion
  - ○ Rupture

4. Systemic Disorder
   - Hypothyroidism
   - Liver disorder
5. Coagulation defects → von villebrands disease, ITP
6. Drugs → Heparin, Warfarin, COCP, IUCD
7. Dysfunctional Uterine bleeding → Diagnosis of exclusion

DUB [DYSFUNCTIONAL UTERINE BLEEDING] 00:33:58

*TIPSCD Absent in DUB

CONDITIONS 00:37:00

ANOVULATORY DUB

1. Puberty Girls
2. Peri menopausal women
3. Metropathia Haemorrhagica

- ANOVULATORY DUB → MC

  in 65% with anovulatory DUB, the Endometrium is Hyperplastic

OVULATORY DUB 00:40:34

1 Corpus Luteal ↓ ed Function

↓

Irregular ripening

↓

Premenstrual spotting/ Bleeding

2 Corpus Luteum ↑ ed Function

↓

Irregular shedding

↓

Post menstrual spotting/ Bleeding

# Chapter 16

# GAMETOGENESIS

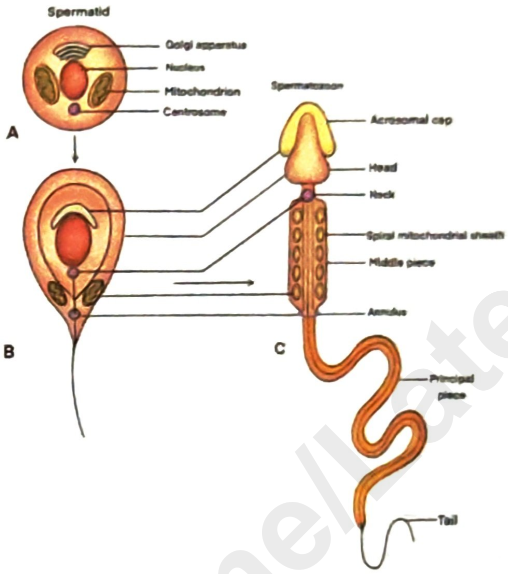
## GAMETOGENESIS

00:00:30

SPERMATOGONIA $\xrightarrow{\text{74-75 Days}}$ SPERMATOZOA

SPERMATID $\xrightarrow[\text{(21- 22 Days)}]{\text{Spermiogenesis}}$ SPERMATOZOA

Spermiation → Release of sperms into Lumen



## IN TESTIS

LH $\xrightarrow{\textit{acts on}}$ Leydig cells $\xrightarrow{\textit{Produce}}$ Testosterone

Testosterone → acts on → *sertoli cells [lining the seminiferous tubules]* ← FSH

Sperms ← *sertoli cells [lining the seminiferous tubules]*

## SPERM PATHWAY

TESTIS [250-290 lobules present]

↓

SEMINIFEROUS TUBULES

↓

RETE TESTIS

↓

EPIDIDYMIS [sperms are stored]

↓ 2-6 days

VAS DEFERENS [more motile sperms]

↓

EJACULATORY DUCT

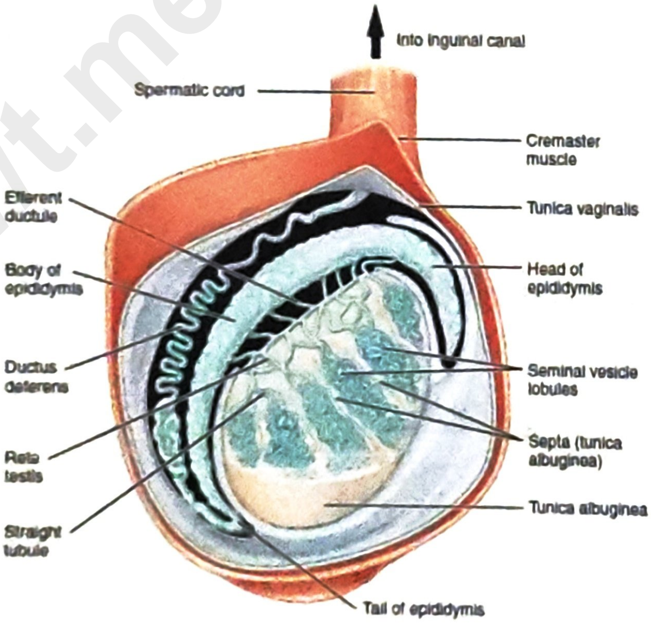
↓

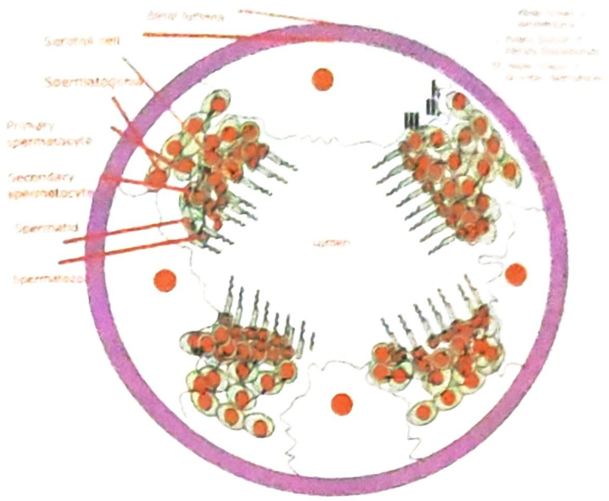
URETHRA

↓

PENIS

## Structure of testis

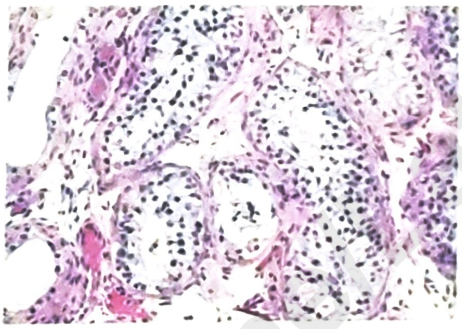




Processes involved in Spermiogenesis

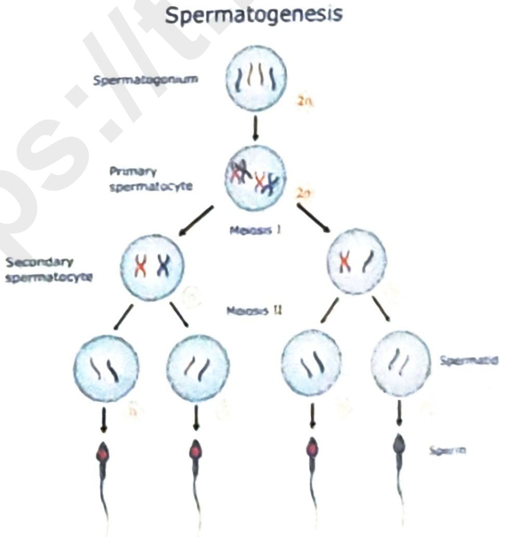
- Condensation of Nuclei
- Acrosomal cap (G. Apparatus)
- Tail formation
- Motility

## HPE SLIDE OF SEMINIFEROUS TUBULE



## SPERMATOGENESIS

00:09:28

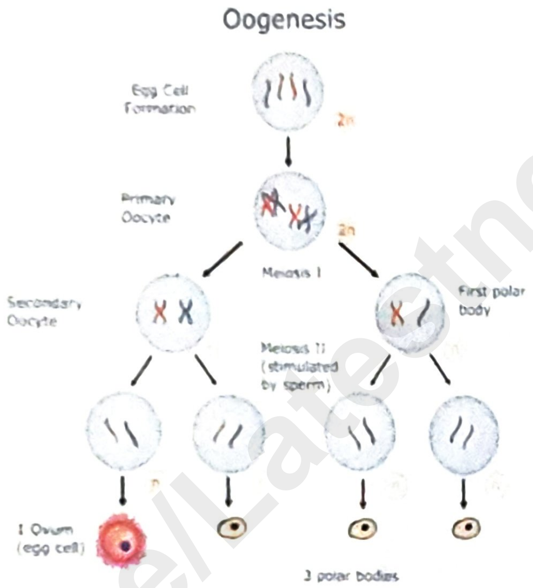


- 1 spermatogonia gives rise to 4 sperms
- SPERMATID $\xrightarrow{48 \text{ hrs}}$ SPERMATOZOA

  [NON- MOTILE] [MOTILE]
- Formation of spermatozoa from spermatid include:
  - Condensation of nucleus occur
  - Formation of tail occur
  - Motility
  - Acrosomal cap [Golgi apparatus]

## OOGENESIS

00:11:40



- 1 oogonium gives rise to 1 ovum & 3 polar bodies [extra genetic material]
- Oogonia starts forming from 8wks of IUL

  ↓

  Primordial follicle

  ↓

  6-7 million at 20 wks

  1-2 million at Birth

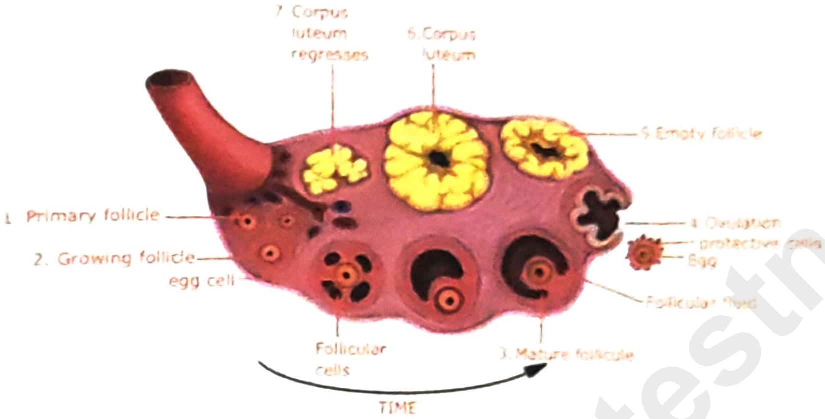
  3-4 lakh at puberty

  ↓

  1 Oocyte released every month

- Oocyte is resting in prophase I [Meiotic division] at the time of birth
- Meiosis I completed at the time of ovulation [puberty]
- Secondary oocyte & 1st polar body released [at the time of ovulation] in metaphase II
- After fertilization, 2nd polar body & ovum are released
- Oocytes are protected by granulosa cells and those not protected undergoes atresia

## STAGES OF DEVELOPMENT OOCYTE 00:18:20



AFTER EJACULATION, Sperms reach posterior fornix of

vagina $\xrightarrow{\text{2 min}}$ ampulla

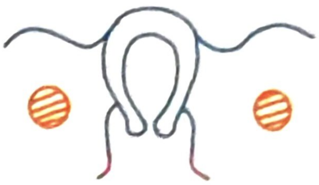
## CAPACITATION OF SPERMS 00:20:30

- The potential to fertilize oocyte
- Takes place in cervical mucus, proximal F. Tube
- Steps responsible for capacitation
  - Influx of Ca+ ions
  - Tyrosine phosphorylation
  - Removal of inhibitory mediator [cholesterol]

| ACROSOMAL REACTION | CORTICAL REACTION |
|---|---|
| Acrosomal cap<br>[Golgi apparatus]<br>↓<br>Acrosome breakdown<br>Release acrosin to fertilize oocyte (Penetrate zona pellucida of oocyte)<br>↓<br>Acrosin (Hyaluronidase) will soften the zona pellucida (Acrosome reaction) | One sperm gets inside<br>↓<br>Cortical granules released in perivitelline space of oocyte<br>↓<br>This reaction makes the oocyte impermeable again & prevents polyspermy |

# Chapter 17

# INTERSEX



| STRUCTURES | DERIVED FROM |
|---|---|
| Uterus<br>Cervix<br>Fallopian tubes<br>Upper 4/5th of vagina | Mullerian/ Paramesonephric ducts |
| Ovaries | Genital ridge |
| Lower 1/5th of Vagina | Urogenital sinus |

## FORMATION OF EXTERNAL GENITALIA

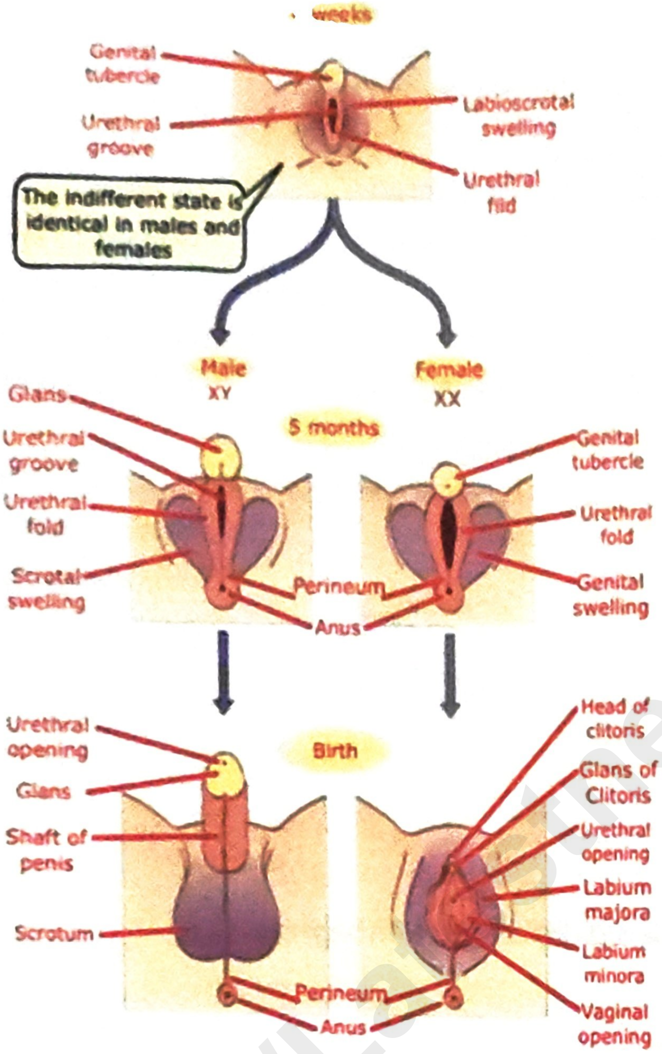
00:01:29

- After 6 wks of intra uterine life, Sexual differentiation begins

- Sexual differentiation is based on

| | |
|---|---|
| Genetic Sex | [46 XX or 46 XY] |
| Gonadal Sex | [Ovary or testes] |
| Phenotype | [vulva or Phallus] |

- Y chromosome has
  - Sex determining Region Y [SRY]
  - Testes Determining Factor [TDF]



- Ext. genital formation is under the influence of ANDROGENS

› 6 Wks
↓
MALE
↓
TESTES
↓
ANDROGENS
↓
Descent of testes
Formation of scrotum
Formation of Penis

› 6 Wks
↓
FEMALE
↓
OVARIES
↓
NO ANDOGENS
↓
Labia majora
Labia minora
Clitoris
Lower 1/5th of vagina by urogenital sinus

## DEFAULT/BASIC HUMAN SEXUALITY → FEMALE

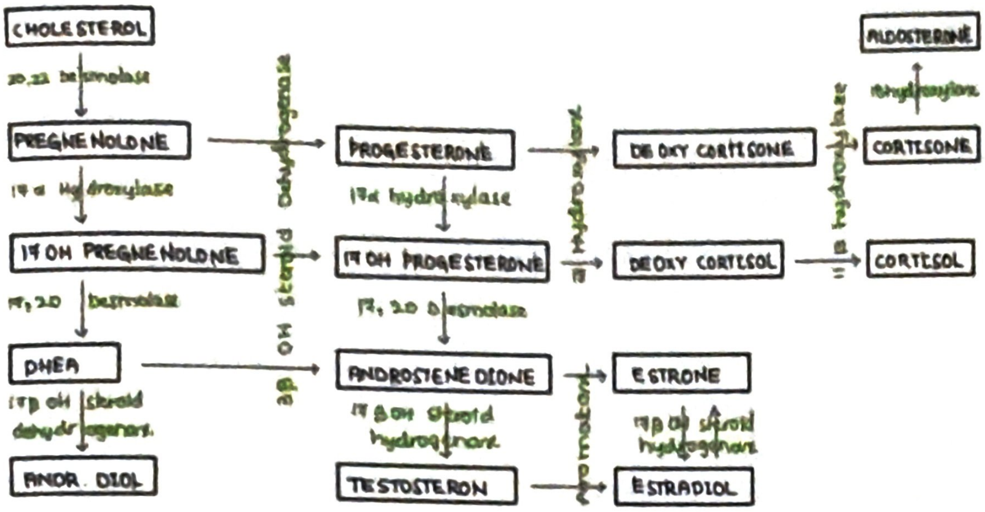
00:08:32

| | MULLERIAN AGENESIS | TESTICULAR FEMINIZATION SYNDROME/ ANDROGEN INSENSITIVITY SYNDROME |
|---|---|---|
| KARYOTYPE | – 46 XX | – 46 XY |
| GONAD | – Ovary | – Testes |
| UTERUS, TUBES | – Absent | – Absent |
| VAGINA | – Shallow Blind | – Shallow Blind |
| VULVA | – Normal | – Normal |
| BREAST | – Feminine | – Large Feminine |
| PERIODS | – Absent | – Absent |
| ANDROGENS | – 20-80 ng/dl | – 200-800 ng/dl |
| PUBLIC / AXILLARYHAIR | – PRESENT | – Absent |

- In Testicular Feminization syndrome,
  - In periphery, ANDROGENS $\xrightarrow{\text{Aromatase}}$ ESTROGENS
  - ESTROGENS → Large feminine breasts
    → Pubic & axillary hair absent

- TFS is distinguished from Mullerian Agenesis by
  - Absent axillary & pubic hair [clinical suspicion]
  - Karyotoping → 46 XY
  - USG reveals undescended testes (mostly in abdomen occasionally in inguinal canal)

- Undescended testes removed in TFS at the time of puberty



- 21 Hydroxylase Deficiency

↓

↓ Steroid Hormones

↓

x Negative feedback to Hypothalamus

↓

↑ ACTH

↓

↑ Sex Hormones

## CONGENITAL ADRENAL HYPERPLASIA (CAH)

00:32:09

- Due to deficiency of 21 Hydroxylase enzyme

1. Classical variety

- Boy → Precocious puberty
- In Girl
  - Penis & scrotum present
  - No testes

} AMBIGUOUS GENITALIA

2. In salt loosing variety
   - ↓ $Na^+$
     ↓ $H_2O$
     ↑ $K^+$
   - Fatal to the baby [boy or girl]

3. Late onset/ Adult onset Adrenal Hyperplasia

- Rx by long term steroids
- MC cause of CAH → 21β hydroxylase deficiency

For more notes visit

Or click this page to visit the channel

$2^{nd}$ mc cause of CAH → 11 β hydroxylase deficiency

- PREVENTION
- Start the steroid at the time of Dx of next pregnancy

- GENETIC MALE & PHENOTYPIC FEMALE
  - MALE PSEUDO HERMAPHRODITE
- GENETIC FEMALE & PHENOTYPIC MALE
  - FEMALE PSEUDO HERMAPHRODITE

EXAMPLES OF
MALE PSEUDO HERMAPHRODITE → TFS
FEMALE PSEUDO HERMAPHRODITE → CAH

- TRUE HERMAPHRODITE
  - MALE + FEMALE KARYOTYPE &
  - MALE + FEMALE GONADS → OVOTESTIS &
  - MALE + FEMALE EXTERNAL GENITALIA

## GONADAL DYSGENESIS 00:44:21

SWYER SYNDROME 00:46:34

- 46 XY female

TURNER SYNDROME

Streak gonads
↓ Estrogens
Small uterus
Primary amenorrhea

MIXED GONADAL DYSGENESIS 00:50:09

- Male + female karyotype
- Male + female gonads
  - U/L undescended testes → Not working
  - Contralateral streak ovary → Not working
- External genitalia → Female
- 1/$3^{rd}$ of mixed gonadal dysgenesis have Turner phenotype

In GONADAL DYSGENESIS, the EXTERNAL GENITALIA is ALWAYS of FEMALE

- MC cause of 1 Amenorrhea → Gonadal dysgenesis

Mc type of gonadal dysgenesis → Turner syndrome

Q. Short stature

Primary amenorrhea
Streak gonad
On USG → hypoplastic uterus

} TURNER SYNDROME

- 46 XX → 1 BARR body [normal female]
- 45XO → No Barr body

→ TURNER SYNDROME

- Short stature
- Shield chest
- Low set hair line
- Lymphedema
- Normal intelligence
- Streak gonad
- Reduced estrogen
- Uterus small
- Pri. amennorrhea

- 46 XY → No BARR body [normal male]
- 47XXY → KLINEFELTER SYNDROME
  - Tall stature
  - Gynecomastia
  - Obesity
  - Azoospermia
  - Infertility
  - Mental retardation

Q. Which one has the best clinical prognosis?

a. CAH

b. TFS

c. MIXED GONADAL DYSGENESIS

d. TRUE HERMAPHRODITES

A. a. CAH

# Chapter 18

# PUBERTAL CHANGES

## PUBERTAL CHANGES

00:00:14

First event of puberty → Growth spurt

### SPECIFIC EVENTS OF PUBERTY IN GIRLS

Breast → Thelarche [T]

Pubic axillary hair → Pubarche [P]

Height → Linear growth spurt or peak growth velocity

Periods → Menarche

- Time taken for the above specific events → 4.5 yrs

## TIMINGS

00:03:31

- Timing to start of periods → 10-12 yrs
- If periods starts 9-10 yrs → EARLY PERIODS

## PRECOCIOUS PUBERTY

00:03:55

- If periods start at <8 yrs → Precocious Puberty
- MC cause of precocious puberty → Idiopathic
- Rx of precocious puberty → GnRH analogues

## DELAYED PUBERTY

00:04:59

- No periods till 13 yrs of age
- Pubarche present, no periods till 15 yrs

## TANNER STAGING 00:06:27

[For breast & pubic hair development]

STAGE I → No growth, no mound, no development of breast

STAGE II → Significant amount of growth present

STAGE III → Much developed breast
→ Nipple is above the midplane of breast mound

STAGE IV → Much more developed breast
→ Secondary mound present

STAGE V → Bigger breast [mature breast]
→ No secondary mound
→ Nipple is below the midplane

- Girls starts development of puberty → 10-12 yrs [10.5 yrs]
- Boys starts development of puberty → 11.5 yrs

- SPECIFIC EVENTS OF PUBERTY IN BOYS 00:08:40

- Testicular size [T]
- Penile length [P]
- Pubic hair
- Growth spurt

- Sequence of puberty onset:
  Obese girls (early) → Normal girls → Low weight → Anorexic Girls (last)
  (Obesity is related to increased ER production)
- After attaining 23.5% fat, girl period starts
- Estrogen mostly responsible for events of puberty in girls like breast development, uterine development, periods
- For Boys androgens mostly responsible for pubertal develop

# Chapter 19

# INFERTILITY

## INFERTILITY

00:00:17

- 15-20% couples are infertile
- INFERTILE → After 1 yr of Unprotected Intercourse
  (Primary/ Secondary)
- Chance of Conception with Unprotected Intercourse
  90% couple → 1 yr
  80% couple → 1st 6 months
  10% couple → next 6 months
- 1 Act of intercourse at 14th day, chance of conception → 4-8%
- Chance of conception with many acts in one month → 25%

## CAUSES

00:07:30

- % of distribution of cases responsible for infertility
  MALE → 20-30%
  FEMALE → 30-40%
  MALE + FEMALE → 10-40%
  UNEXPLAINED → 10-20%

### MALE CAUSES

- Oligospermia
- Azoospermia

### FEMALE CAUSES

- Anovulatory factors > Tubal factors
  (Most treatable one)

## WHO CLASSIFICATION OF ANOVULATION 00:11:00

| | |
|---|---|
| TYPE I | Hypogondotropic Hypogonadism |
| TYPE II | Normogonadotropic Hypogonadism → PCOS |
| TYPE III | Hypergondotropic Hypogonadism<br>→ Premature ovarian failure |
| TYPE IV | Hyperprolactinemia |

## HISTORY TAKING

### MALE SPECIFIC HISTORY 00:15:30

- Act of intercourse
- Infections → mumps, TB, filariasis, STDs
- Previous Sx → Orchidopexy/ undescended testes
  → Hernia Sx, Varicocele Sx, Hydrocele Sx
- Alcoholic, smoker

### FEMALE SPECIFIC HISTORY 00:20:42

- Infections → Recurrent PID, Endometriosis, TB pelvis
- MTP/Abortions → Inflammation → tubal blockage
- Alcohol, smoking

## INVESTIGATIONS

1. MALE 00:26:29

### SEMEN ANALYSIS

- 1st investigation to be done
- 2010 WHO SEMEN ANALYSIS

- PH → >7.2
- Volume → > 1.5 ml
- Concentration → > 15 million/ml
- Count → > 39 million [36-42 million]
- Motility → > 40% [32% must be actively motile]
- Morphology → > 4% shuold be Ⓝ [Kruger's strict criteria]
- Vitality → > 58% should be normal
- Leucocyte Count → < $1 \times 10^6$ /ml

### 2. FEMALE 00:30:20

P/V Examination

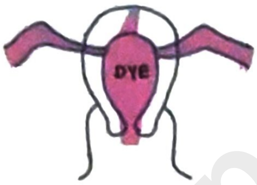
TVS

Ovulation tests

- Basal body temperature [>0.5° F ]
- USG - Follicular Monitoring
- LH → > 15 IU
- Sr. Progesterone → > 3ng/ml on day 21
- Endometrial biopsy

HYSTEROSALPINGOGRAPHY

- Tells about uterine cavity
- Tells about tubal patency



LAPAROHYSTEROSCOPY 00:35:32

- Better investigation to know anatomy
- Diagnostic
- Therapeutic

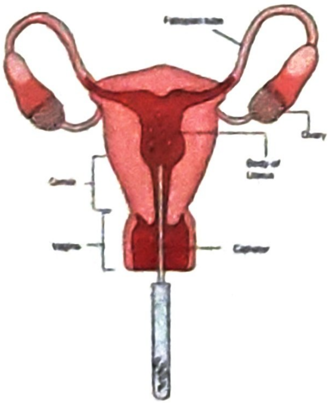
### TREATMENT 00:37:30

1. OVULATION INDUCTION

- Indicated for anovulation
- Clomiphene citrate
- Letrozole
- HMG
- FSH

2. INTRA UTERINE INSEMINATION

- by washed sperms

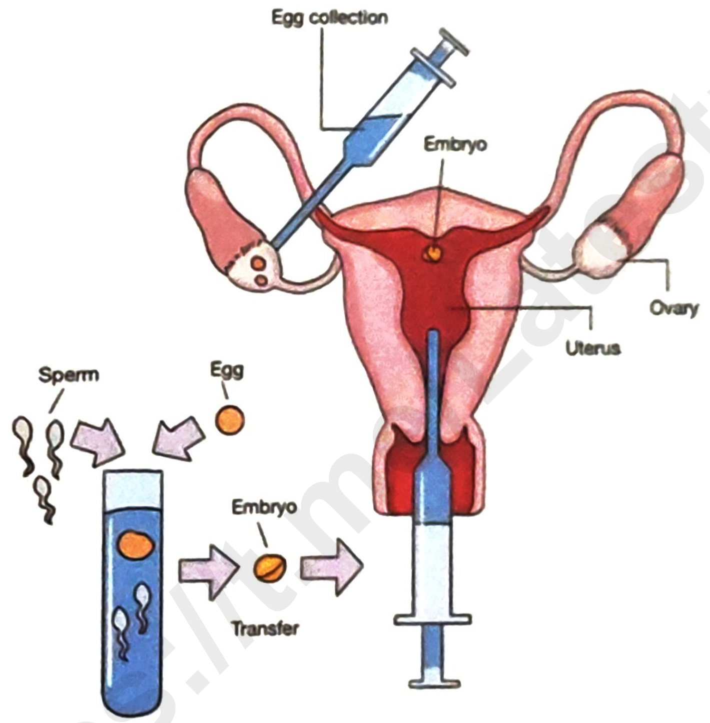


- Indicated for low count sperms, Endometriosis, cervical factor infertility
- Successful in 15-20% of cases

### 3. IN VITRO FERTILIZATION 00:41:30

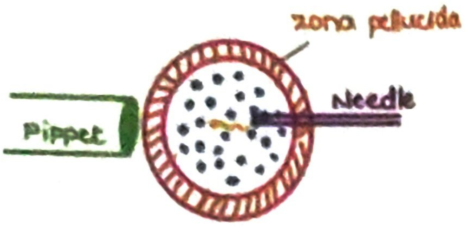
- Indicated for tubal blockage, low count sperms, Endometriosis, cervical factors fertility
- 2 or 3 , Day 3 (8 cell) embryos are transferred or
  1 or 2 , Day 5 (Blastocysts) embryos are transferred
- Success rate → 40-45% [pregnancy]
  Take home baby rate → 25-30%

INVITRO FERTILIZATION

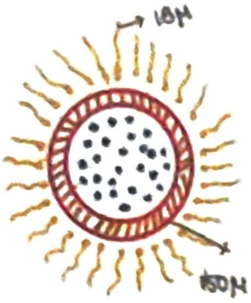


- IN VIVO,
  1/5th of semen will reach the site of fertilization
  1 lakh sperms collide with ovum & release ACROSIN
  Acrosin soften the ZONA PELLUCIDA → ACROSOME REACTION
  Fertilization occurs & followed by ZONA REACTION, which hardens zona again

- IVF requires 1 lakh sperms to fertilize an oocyte so, for IVF at least 3-5 million sperms required
- For IUI at least 5-10 million sperms required

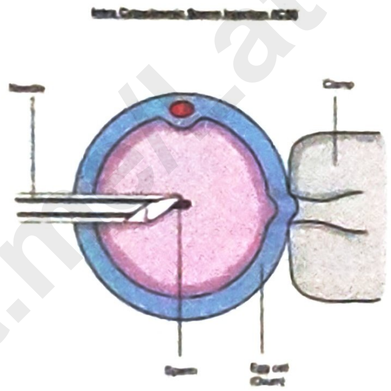


ICSI



4. INTRA CYTOPLASMIC SPERM INJECTION 00:54:16

- Indicated for very low sperm count



## AZOOSPERMIA

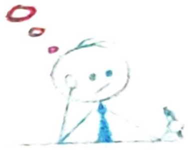
[Obstructive azoospermia]

- Normal FSH & azoospermia → obstructive azoospermia
- SPERM EXTRACTION TECHNIQUE

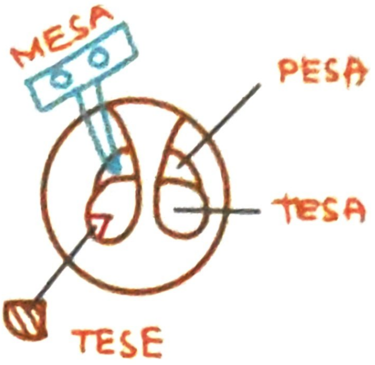
PESA [Percutaneous Epididymal Sperm Aspiration]

TESA [Testicular Sperm Aspiration]

- Both can be done under local anesthesia
- Both are simple techniques [needle aspiration]

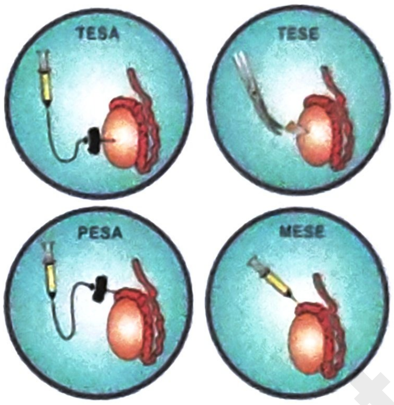


MESA [ Micro Surgical Epididymal Sperm Aspiration]



TESA [Testicular Sperm Extraction]

- Both are done under GA
- Both are complicated techniques



Q. Best technique to get quality sperms?

a. PESA

b. TESA

c. MESA

d. TESE

A. c. MESA

Q. Controlled ovarian Hypersitmulation was given for IVF Pre trigger [HCG], Estrogen levels → 800 pg

What is the next step in management

a. Cancel the cycle

b. Continue stimulation for 1 to 2 days check estrodiol

A. a. Cancel the cycle

- IDEAL TEMPERATURE FOR SPERMATO GENESIS → 35-35.5° C

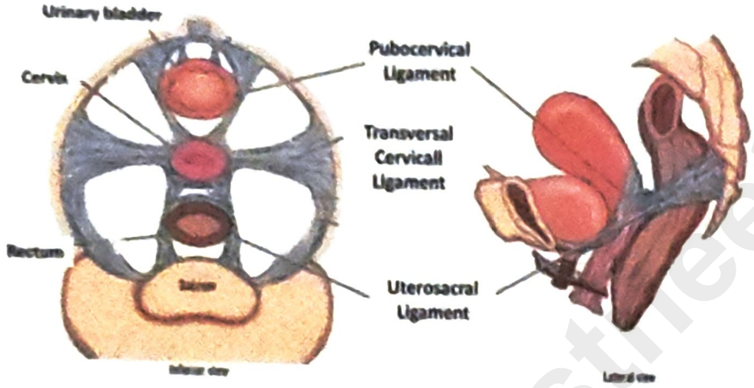
## Chapter 20

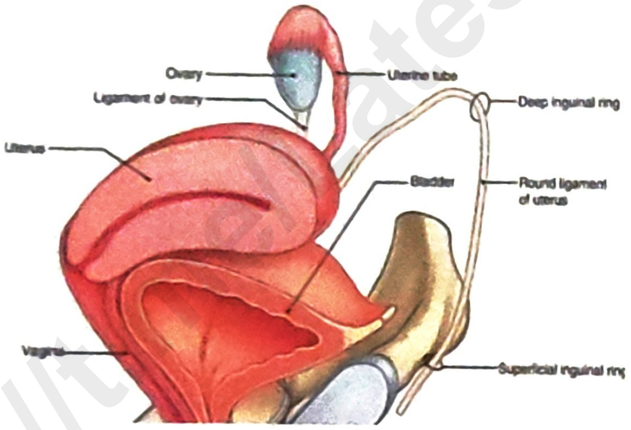
# GENITAL PROLAPSE

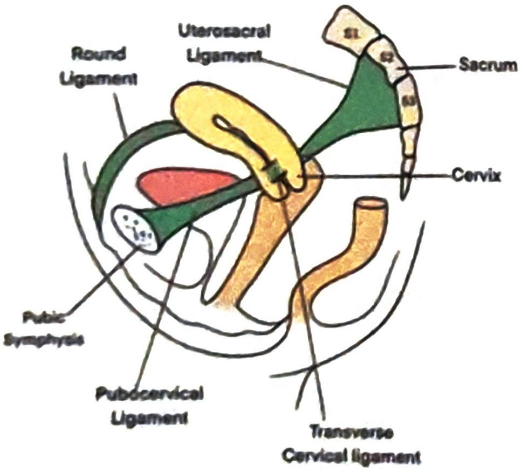
### SUPPORTS OF UTERUS

00:00:28

### LIGAMENT SUPPORT

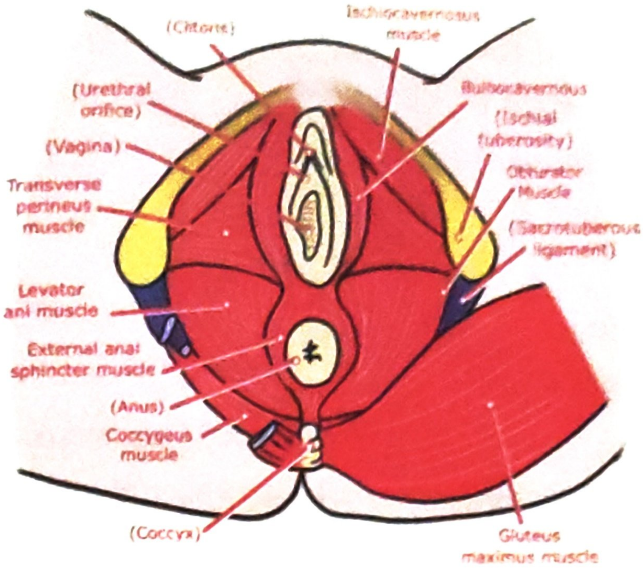






https://t.me/latestpgnotes

## MUSCULAR SUPPORT



- Muscles are the best supports of the uterus

## CAUSES

00:04:30

- Abnormal conduct of labour → most important cause
  - Early bearing down
  - Prolonged 2nd stage
  - Faulty instrumentation
  - Early resumption of work
  - Multiparty
- Connective tissue disorder
- Spina bifida
- ↑ Abdominal pressure
  - Ascites
  - Chronic cough
  - Abdominal mass

## EARLY BEARING DOWN

[Against the partly dilated (3cm or 5cm) cervix]

- Leads to cervical stretching / elongation & cervical descent
- IN parous prolapse, usually cervical elongation is present

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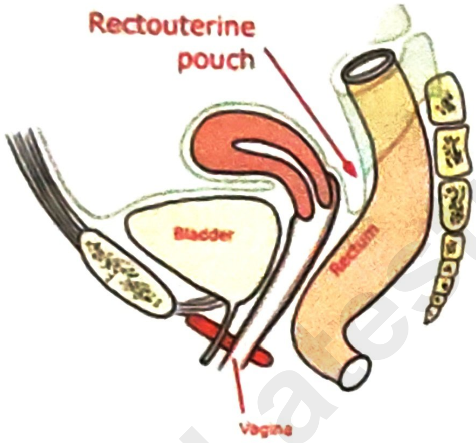
PROLONGED 2nd STAGE OF LABOUR

- In primi → 1 hr ; upper limit is 2hr
  In multi → 1/2 hr ; upper limit is 1hr
- Ischemic damage of nerves causing Neuronal injury
  - single most important injury predisposing to prolapse

FAULTY INSTRUMENTATION

- Good instrumentation prevents prolapse
- Faulty instrumentation causes prolapse

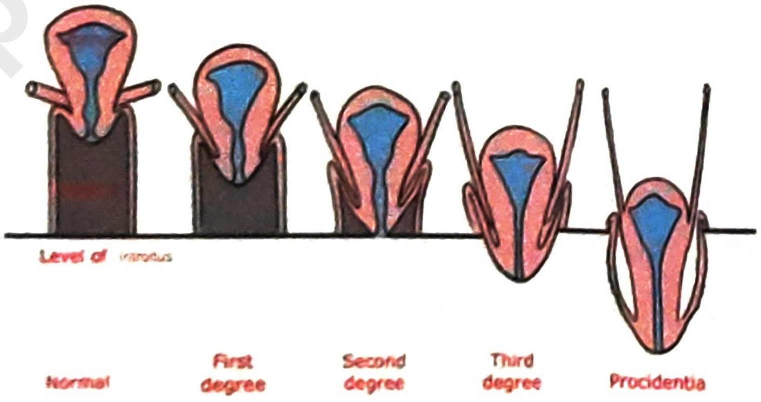
EARLY RESUMPTION OF WORK → < 6wks of purperium



SHAW'S CLASSIFICATION

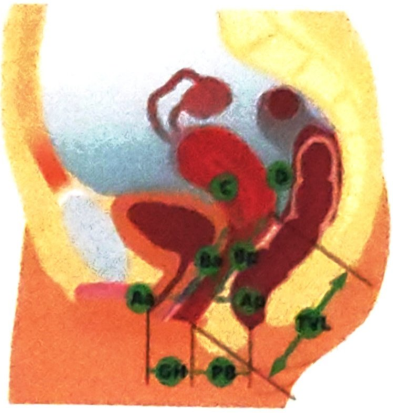
00:19:46

STAGE I → Cervix is just below the normal level
STAGE II → Cervix is at introitus
STAGE III → Cervix is outside
STAGE IV → PROCIDENTIA
[full uterus has prolapsed]



## POP Q SYSTEM

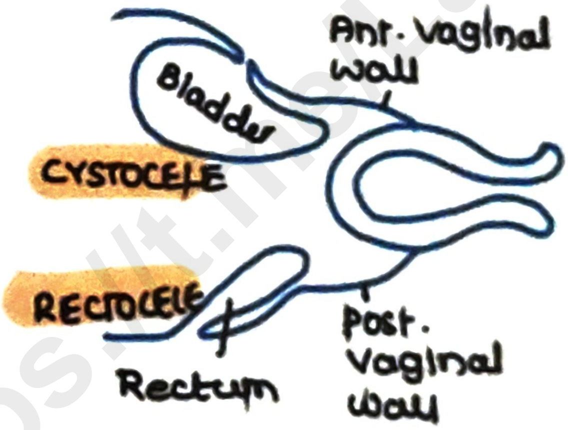
00:21:02



- Pelvic organ prolapse Quantification system
- Reproducibility is good & good for comparision

## PARTS OF PROLAPSE WHEN YOU GO FROM ANTERIOR TO POSTERIOR

- Anterior vaginal wall 00:24:47
  Urethrocele
  Cystocele
  Uterus
  Rectocele
  Posterior vaginal wall



## CYSTOCELE – COMPLICATIONS

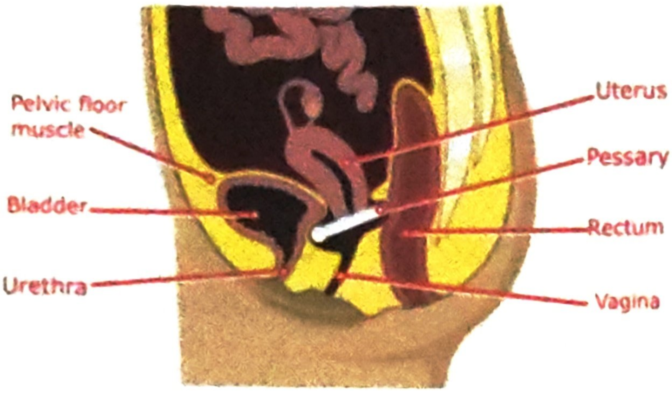
00:26:16

- Difficult in initiation of micturition
- Retention of urine
- Infection
- Stone formation

## RECTOCELE – COMPLICATIONS

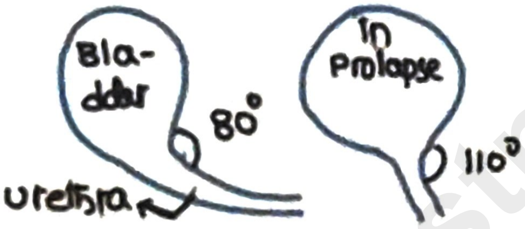
00:26:48

- Difficult initiation
- Fecolith formation



## OTHER COMPLICATIONS

00:28:47



- Venous congestion due to vaginal band - DEOXYGENATED UTERUS
- Decubitous / Dependent Ulcer [due to venous congestion]
  - Rx → Repositioning with pessary
- Stress Urinary Incontinence
- Dragging sensation, } MC

Something coming out of vagina } Presentation

Sense of insecurity in the vagina / perineum

## PREVENTION OF PROLAPSE

00:35:11

- Physiotherapy
  - antenatal
  - Post natal

## TREATMENT

00:37:22

- Rx for elderly women [mc age group]

1. Vaginal Hysterectomy With Pelvic Floor Repair
   - Aka WARD & MAYO'S OPERATION
   - Hysterectomy done
   - Repositioned bladder & rectum
   - Vault closure done
   - Anterior colporraphy done
   - Posterior colpo perineorraphy done } PELVIC FLOOR REPAIR

- VAULT PROLAPSE
  - ○ Present in 3-4 months of surgery of WARD & MAYO'S OPERATION
  - ○ Due to pressure by enterocele through peritoneal defects
  - ○ MC cause → Neglected enterocele
  - ○ Prevented by High ligation or closure of peritoneal defect
  - ○ Rx by SACROSPINOPEXY / SACROPEXY
    - ○ Reposition the vault physically
    - ○ Tie the vault to ischial spines or uterosacral ligament

- STRESS URINARY INCONTINENCE
  - ○ Present by 2-3 weeks of Sx [hyperterectomy]
  - ○ Due to improper anterior wall repair

- Rx for younger women 00:55:55

FOTHERGIL REPAIR/ MANCHESTER REPAIR

- Reposit the uterus
- DNC [Dilatation & currettage] to be done
- Do cervical amputation for the lax/ elongated cervix
- Pelvic floor repair done along with mackenrodt' ligament
- Reposit the bladder & rectum
- Pioneered by DONALD in Manchester city hospital

- Rx For Nulliparous Prolapse Of Very Young Women

SLING SURGERIES

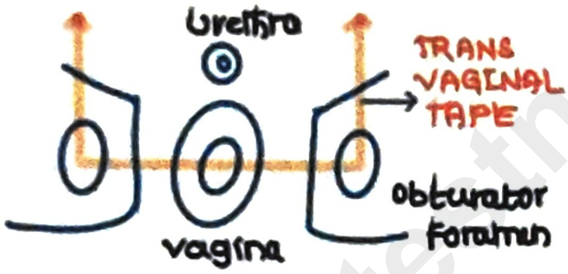
- Tie a sling to the posterior part of cervix & pull in & tie inside
- SHIRODKAR SLING → Tie to anterior longitudinal ligament

| | |
|---|---|
| KHANNA'S SLING | Tie to anterior superior iliac spine |
| PURANDARE'S SLING | Rectus shealth |

## STRESS URINARY INCONTINENCE 01:04:04

- Due to improper anterior colporraphy
- Can be a complication in 2-3 weeks after hysterectomy
- Surgical management 01:08:19

  1. PEYRERA'S } - Needle suspension procedure
  2. STAMEY'S } - Uplifting of urethra
  3. MMK's COLPOSUSPENSION } Uplifting of ant. vaginal wall
  4. BURCH COLPOSUSPENSION }
  5. TRANS VAGINAL TAPE



  6. KELLY'S STITCH

- Plicate the paravesicle tissues under the bladder neck

- BEST LONG LASTING RESULTS GIVEN BY COLPOSUSPENSION [upto 95%]

# Chapter 21

# URINARY FISTULA IN OBSTETRICS

## Obstructed Labor

Definition: No progress of labor inspite of good Uterine contractions (i.e. there is no descent of the Presenting Part)

### Causes

- Neglected Cephalopelvic disproportion (MC)
  - Large baby
  - Contracted Pelvis

- Malpresentation
  - Transverse Lie with shoulder presentation
  - Neglected Brow presentation

- Malpositions
  - Occipito-posterior

### Signs

- Hematuria
  - Presents early
  - Due to pressure of Fetal head on Bladder which results in damage of Vesical venous plexus

- Vesico Vaginal Fistula (VVF)
- Injury to posterior part of Vagina →Rectal tear

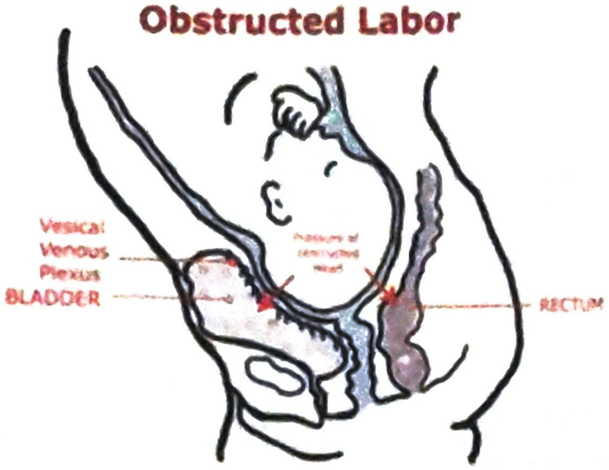
Late presentation

*In case of ischemic injury to Vagina & Bladder

- 5-7 days later, Vesico Vaginal Fistula presents

- VVF is prevented by Urinary catheterization for 14-21 days

**Obstructed Labor**



### Management

- Mx of Obstructed labor → C-section
- Obstructed labor with dead baby → C-section

### Maternal Complications

- Rupture of Membranes

  ↓

  Chorioamnionitis

  ↓

  Puerperal Sepsis

  ↓

  Shock

  ↓

  Death

- Ruptured Uterus → Shock → Death
- Bladder & Rectal Injuries
  - Stress Urinary incontinence
  - VVF
  - Rectovaginal fistula

### Fetal Complications

- Still birth (Born Dead)
- Hypoxic Brain damage
- Neonatal Death

## URINARY FISTULAS IN OBSTETRICS

### CAUSE OF VESICO VAGINAL FISTULA

00:06:04

1. OBSTETRIC CAUSES
   - Obstructed labour
   - Faulty instrumentation
   - Destructive operations

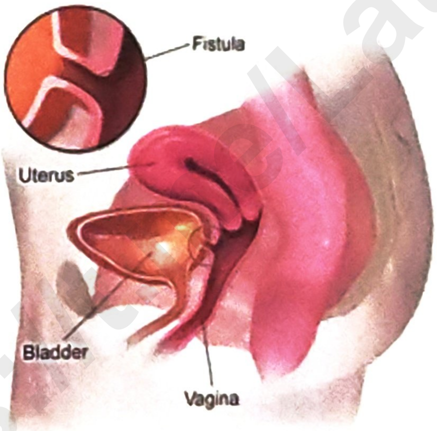
2. GYNAECOLOGICAL CAUSES
   - Hysterectomy
   - WERTHEIM → Ureteric dissections

3. RADIATION INJURIES → painful fistula

### PRESENTATION

00:08:06

- Constants dribling of urine
- vulva & thighs are excoriated
- Splash dysuria
- UTI



Vesicovaginal Fistula

### TREATMENT

00:10:34

- DIVERT THE STREAM → With catheter
- ZINC CREAM ON THIGH → works as emollient
- ANTIBIOTICS
- REPAIR
  - Do not repair immediately

- Wait for scarring to happen
- Wait for $2^1/_2$ - 3 months

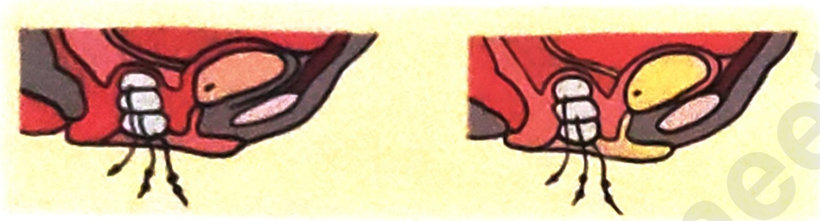
DIAGNOSIS 00:15:00

1. 3 SWAB TEST

- Methylene blue is injected into the bladder

a. MID VAGINAL FISTULA

- MC in our country
- Due to obstructed labour



3 SWAB TEST

b. HIGH VAGINAL FISTULA

- d/t Forceps

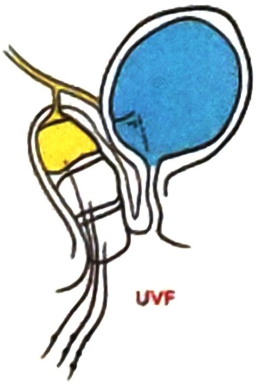
Vaginal hysterectomy

c. LOW VAGINAL FISTULA

- d/t Urethro vaginal Fistula or

Low vaginal Fistula d/t radiation injury

- Destructive operations can cause any type of fistula



## CASE

→ Top most cotton ball is not blue in color but it is colourless but WET

- Urinary source is not bladder
- Source is Ureter → URETERO VAGINAL FISTULA
- Leaking + continence +nt

## 2. DOUBLE DYE TEST

- Cotton balls in vagina
- Methylene blue in the bladder
- Pyridium tablets given Orally → Impact RED colour to urine
- Helps to Dx Ureterovaginal Fistula

## 3. Best diagnostic test for vesico vaginal Fistula

→ Cystoscopy

Best diagnostic test for uretero Vaginal Fistula

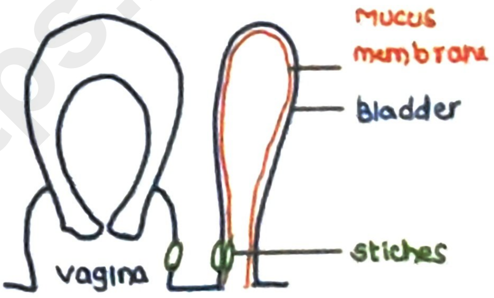
→ Intravenous Urography

## YUSSUF'S SYNDROME 00:21:29

- Vesico Uterine Fistula
- Presents with menouria

## REPAIR 00:23:10

## 1. SIMS SAUCERIZATION FOR VVF



SIMS SAUCERIZATION

- done under General anesthesia

- 3 Circular stiches on
  - Mucus membrane of bladder
  - Bladder
  - Vagina
- Done in KNEE CHEST POSITION

### 2. LOW RECTO VAGINAL FISTULA REPAIR

- Make it a complete Perineal Tear & repair

### 3. HIGH RECTO VAGINAL FISTULA REPAIR

- Divert the bowel → Colostomy
- Repair in layers

## PERINEAL TEARS

00:28:20

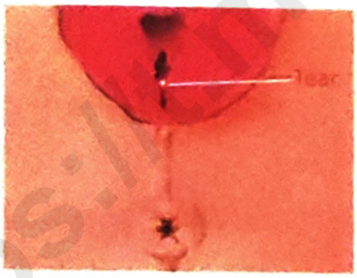
- Mucosal layer tear of vagina → TYPE I
- Mucosa + muscle tear → TYPE II
- Mucosa + muscle + Anal tear → TYPE III

‹ 50% External anal Sphincter tear - III a

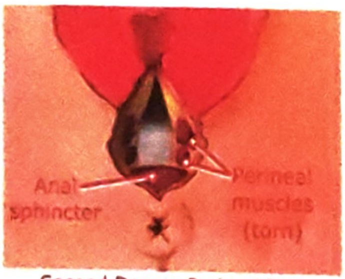
› 50 % External anal sphincter tear - III b

Internal anal Sphincter tear - III c

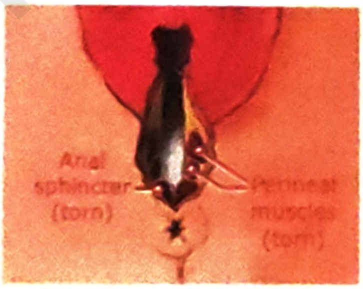
- MUCOSA + muscle + Anus + Rectal tear → TYPE IV



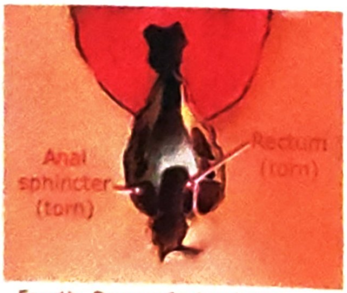
First Degree Perineal Tear



Second Degree Perineal Tear



Third Degree Perineal Tear



Fourth Degree Perineal Tear

## COMPLETE PERINEAL TEAR

- TYPE III
- TYPE IV     Complete Perineal Tear → Repair immediately
- After 24 hrs in a complete tear, there is colonization of cut ends
- Will breakdown if repaired
- Wait For $2^{1}/_{2}$ - 3 months [at least 6 wks]

## Chapter 22

# EMERGENCY CONTRACEPTIVES

### INTERCEPTION / EMERGENCY CONTRACEPTION / POST COITAL CONTRACEPTION

00:00:20

- Contraception within 72 hrs of unprotected intercourse
- Implantation of embryo takes place during 6th day after intercourse. So, abortion cannot be done for these cases. Emergency contraceptives are preferred
- ABORTION IS NOT A METHOD OF EMERGENCY CONTRACEPTION

### DRUGS USED IN EMERGENCY CONTRACEPTION

00:03:03

1. LEVONORGESTREL
    - Contains Progesterone
    - DOSAGE → 0.75 mg x 2 tablets
      → 1.5 mg of 1 tablet available now
    - MOA 1

      1) ↓ LH → ↓ Ovulation → No pregnancy

      2) Progesterone → ↑ ↑ Endometrial secretion → Too Fluffy/ out of phase Endometrium → Difficult for embryo implantation

      3) Progesterone → ↓ tubal motility → Late arrival of embryo into Uterus → No IMPLANTATION

    - Thickening of cervical mucus [This mechanism can not be used for emergency contraception as the sperms have already crossed the cervix after intercourse

2. YUZPEE REGIME [COCP]
    - 2 pills given at morning, after 12 hrs of time another 2 pills are given

- MOA
  - COCP reduces ovulation
  - COCP reduces chances of implantation by altering endometrium
- S/E ↑ Vomiting

3. MIFEPRISTONE / RU 486 / ANTI PROGESTIN
   - MOA →reduces implantation
   - DOSAGE →10-50 mg for emergency contraception

4. ULIPRISTAL ACETATE
   - Selective progesterone receptor modulator [SPRM]
   - Dosage → 30 mg, 1 tablet
   - ELLA → Brand name
   - Better than Levonorgestrel [as it is effective upto 5 days]
   - Not the DOC of emergency contraception d/t non regular availability in India

5. INTRAUTERINE CONTRACEPTIVE DEVICE [IUCD]
   - IUCD reduces implantation
   - USEFUL UPTO 5 DAYS [uniformly effective]
   - Most effective method among emergency contraceptives, but not the best method as it requires insertion of device [not a comfortable procedure]

CRITERIA FOR DRUG OF CHOICE FOR EMERGENCY CONTRACEPTIVES

- Over the counter available drug
- no prescription required
- Easy to use

Best method of emergency contraception → Levonorgestrel
DOC of emergency contraception → Levonorgestrel
Brand name of Levonorgestrel → i-PILL

## TYPES OF ORAL CONTRACEPTIVE PILLS
00:16:15

### 1. MONOPHASIC PILLS

- Fixed dosage of Estrogen & Progesterone with good control of cyclicity but not with side effects
- Eg. Oestrogen → Upto 50 μg/day ;
  Progesterone → Upto 1 mg/day

### 2. BIPHASIC PILLS

- Fixed amount of estrogen while the amount of Progesterone is increased after mid cycle
- Eg.Oestrogen → Constant
  Progesterone → 11 days at 50 μg, rest 10 days at 125 μg

### 3. TRIPHASIC PILLS

- amount of progesterone is constantly increased in 3 phases, While amount of estrogen may be fixed or variable by increasing little and back to original dosage
- Eg. Estrogen → 30 μg / 40 μg / 30 μg Progesterone → 50 μg / 75 μg / 125 μg
- Triphasic pills are for better cyclic control & fever side effects

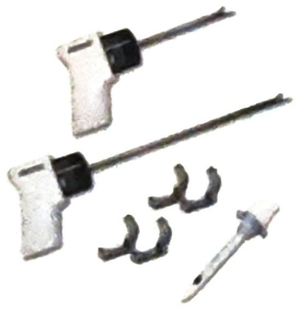
## LAPAROSCOPIC STERILIZATION
00:18:28

Done for Interval procedures

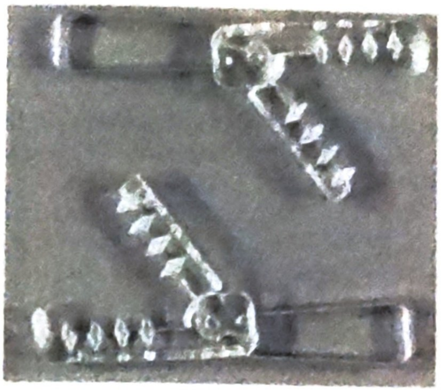
Site: Isthemic

Laparoscopic sterilization done by using

### 1 LAPAROSCOPIC CLIPS



FILSCHE CLIPS (Clips without serration)


HULKA CLEMENS CLIPS (Clips with serrations)

## 2 LAPROSCOPIC RINGS

FALLOPE RINGS

- FALLOPE RINGS are silastic rings that are forced over the tube using Laprocator
- Isthmus of Fallopian tube is the area to be ligated For sterilization
- A loop is made at the Fallopian tube [near isthmus] & Fallope ring are Forced at the base of the loop. They provide tight grip & cause ischemic necrosis of Fallopian tube instantaneously & the loop Fall off

## 3 CAUTERIZATION

- Types of Cautery
  - Monopolar cautery (Damages tube more than Bipolar cautery
  - Bipolar cautery

- BIPOLAR CAUTERY
  - Current goes from one prongs to the fallopian tube & goes to the other prong & goes back to machine [generating to current]

- MONOPOLAR CAUTERY
  - Current flows through the instrument into the fallopian tube & into the earthling attached to patient
  - Current dissipation is more in monopolar cautery
- Fallopian tube is held b/w the prongs of cautery & high voltage current is passed which burns the tube at isthmus & also lateral side of tube [which makes it the last priority]
- not recommended now - a - days
- It has worst chances of reversibility

RE-ANSATOMOSIS

| | | |
|---|---|---|
| Laparoscopic Clips | →Hulka, filsche | (BEST) |
| | →Ring: fallope | |
| Cautery | →Lap/ open (pomeroy) | (WORST) |

IUCDS [Intra Uterine Contraceptive Devices] 00:24:45

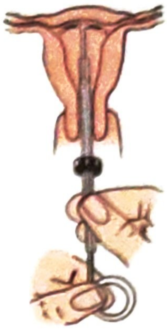
Function:

- To induce Foreign body action
- Uterus will contract to expel the FB [IUCD], thus the FB action will expel the embryo

| | | |
|---|---|---|
| • 1st Genearation IUCD | → | LIPPES LOOP [Inert] |
| • 2nd Generation IUCD | → | COPPER DEVICES [Multiload] |
| • 3rd Generation IUCD | → | PROGESTERONE CONTAINING IUCDS |

## COPPER DEVICES / 2nd GENERATION IUCDS / CU 380 A

CU 380 A



Insertion of CU-T

- A → Arms [contain copper]
- 380 → amount of CU in CU 380 A → 380 mm2
- Gold / Silver is impregnated with copper
- can be used upto 10 yrs

MOA

- Foreign body action
- Aseptic Inflammation of endometrium causing reduced chance of implantation
- Reduction of sperms motility
- Fertilization ↓↓
- Sperm destruction

## HORMONE CONTAINING IUCDS / 3rd GENERATION IUCDs

- PROGESTASERT
  - contains 38 mg Progesterone
  - 65 μg of progesterone is released per day
  - can be used for 18 months

MOA

- Foreign Body action to prevent pregnancy
- Cervical mucus thickening [major action]
- Non receptive endometrium [ ↑ progesterone causes atrophic endometrium]
- Anovulation [40% of patients only]

- LEVONORGESTREL CONTAINING IUC DEVICES [MIRENA]
  - contains 52 mg of progesterone
  - 20 µg of progesterone is released per day
  - can be used for 5 years

USES

- contraception
- ↑ bleeding control/ menorrhagia control

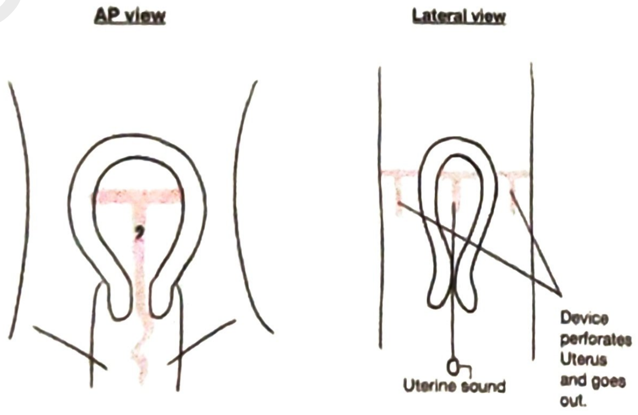
MOA

- Foreign Body action to prevent pregnancy
- Cervical mucus thickening
- Non receptive endometrium [major action]
- Annovulation

SIDE EFFECTS OF IUCD 00:33:45

- Bleeding
  - MC side effect [3 times more common than pain]
  - Tranexamic acid & NSAIDs are given for 1st 3 cycles during periods
  - Best time of insertion of IUCD → within last days of periods
- Pain [2nd mc S/E]
- Infection
- PIDs [Should be ruled out before inserting IUCDs]
- Perforation [rare]

Copper device perforating uterus



## ECTOPIC PREGNANCY & IUCDS

- Chance of Ectopic Pregnancy if a Normal Women Conceives → 1-2%
- % of Type of Pregnancy if a Women With IUCD Conceives
  - Intra uterine pregnancy → 95-96%
  - Ectopic pregnancy → 4-5%
- CATCH POINT
  - Incidence of pregnancy is less for women with IUCD when compared with normal women
  - Therefore, incidence of ectopic pregnancy is also for women with IUCD when compared to normal women without IUCD

* If a women with IUCD is pregnant → Rule out Ectopic pregnancy

## MANAGEMENT OF IUCD WITH PREGNANCY

- Remove IUCD → IUCD + Pregnancy → > 50% chances of abortion
- Manage As Patients Wish

| | |
|---|---|
| Wants to continue pregnancy<br>↓<br>Continue pregnancy | Does not wants to continue pregnancy<br>↓<br>Offer medical termination of pregnancy |

- If Thread Not Seen i.e IUCD Can Not Be Removed

| | |
|---|---|
| Wants to continue pregnancy<br>↓<br>Continue pregnancy with IUCD with advise of risk of abortion being 50% & risk of premature rupture of membranes<br>Anomalies can not happen with IUCD | Does not wants to continue pregnancy<br>↓<br>Offer medical termination of pregnancy |

- MISSING IUCD
  - Advise patient that IUCD will expel spontaneously & ask them to feel for IUCD thread over vagina for the 1st 3 cycles
  - If she cannot feel for thread, in OPD, IUCD is removed with the help of IUCD hook
  - Even if IUCD can not be removed using hook, use ultrasound/ x-

Ray of Pelvis to locate IUCD

- Some times, If IUCD is perforated,
  - ○ First AP view of X-Ray is preferred to check whether IUCD is inside the body of the patient
  - ○ If IUCD present, then do lateral view of x-ray to see whether IUCD is inside the uterus/outside the uterus

## CONTRAINDICATIONS OF IUCDS 00:44:20

- Pregnancy
- Puerperal Sepsis
- STD/PID
- Undiagnosed Vaginal bleeding
- Uterine anomalies
- Cancer of cervix
- Cancer of uterus

## IMPLANTS 00:45:55

- Progesterone containing devices
- SUB DERMAL IMPLANTS
  - inserted into arm of women
  - very good control as contraceptive
  - Failure rate of implants is very low even when compared to vasectomy & tubectomy

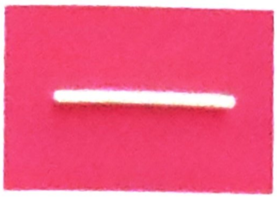
## NORPLANT

- Contains 36 mg of Progesterone & 6 rods [total → 216 mgs of Progesterone]
- Can be used For 5 years

## NORPLANT II/ JADELLE

- Contains only 2 rods → lesser discomfort For patients
- Contains 75 mg x 2 → 150 mg of Progesterone
- Can be used for 3 years
- Should be removed after 3 years surgically under LA

## IMPLANON



- Contains 68 mg of Etonogestrel
- Etonogestrel is biological metabolic of Desogestrel
- Can be used For 3 years
- Has only one rod [less discomfort]
- Easy insertion & easy removal

NEXPLANON

- Advancement of implanon
- has Barium Sulphate coated arm
- Localization can be easier

Common S/E of Implants 00:50:48

- Headache
- Weight gain
- Vaginitis
- Irregular bleeding
- Breast pain
- Abdominal Fullness, pain

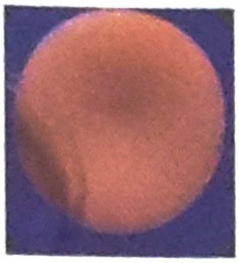
Common S/E of Implant → Break Through Bleeding

NUVA RING/VAGINAL RING

- Contain Etonogestrel + Ethynyl Estradiol
- Can be inserted just before intercourse
- Etonogestrel → 0.120 mg/day are released through

- Ethynyl Estradiol → 0.015 mg/day } the ring
- Work for 3 weeks
- After removal, within a gap of 1 week, women will get her periods & then reinsertion can be done
- Conveniently used as they don't have to remember

## SPONGE / TODAY



- can be inserted Just before intercourse into vagina
- Works For 24 hrs
- contain Nonoxynol - 9 [Spermicidal]
- has band attached to it which makes it easy for removal

## INJECTABLE PROGESTERONE

* Used as Hormones

- DMPA [DEPOT MEDROXYPROGESTERONE ACETATE]
  - contains 150 mg of progesterone
  - Given once in 3 months

- NET-EN [NOR ETHISTERONE ENANTHATE]
  - Contains 200 mg of progesterone
  - given once in 2 months

### MOA of DMPA & NET-EN

Continuous injection of DMPA & NET-EN

↓

Endometrium becomes atrophic

↓

Reduces implantation increased cervical mucus thickening causes anovulation

## EVRA PATCH

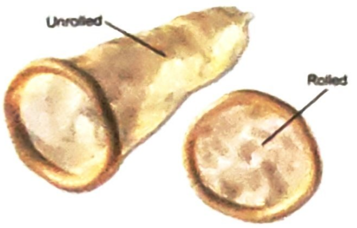
- Size of 4 cm approx. applied over the arm, abdomen
- Contains E. Estradiol & Norelgestromin
- E. Estradiol of 20 µg & Norelgestromin of 150 µg per day are released
- has to be changed every week & the 4th week is given as break & patient will have periods

## BARRIER

00:59:44

- most convenient contraceptives
- Eg. condoms, Diaphragms

## CONDOMS



Male Condom

Female Condom

- not used as ideal method all the time
- Conveniently used for people having multiple partners
- Interferes with pleasures
- high failure rate

## DIAPHRAGM / DUTCH CAP

- Convex part is facing outside ; hollow part fixes into the cervix
- always used with spermicidal cream/Jelly [nonoxynol-9]

- can be used during intercourse
- For best effectivity → insert atleast 4 hrs prior to intercourse
- Should be removed within 6 hrs of intercourse
- If not removed → Toxic shock syndrome d/t staph. aureus (mc), strepto- coccus [rarely] may occur

## NATURAL METHODS OF PREVENTING PREGNANCIES 01:03:42

Failure rate is very high

1. Abstinence [no sex]
2. Withdrawal Technique
   - Pulling out before ejaculation
   - DISADVANTAGES

     → pre-ejaculate can have sperms that can lead to pregnancy

     → high failure rate
3. Rhythm Method / Fertile Period Method / Safe Period Method/ Calendar Method
4. Cervical Mucus Method/Billing's Method

- Thin cervical mucus / wet days → avoid intercourse
- Thick Cervical mucus / Dry days → can have intercourse

5. Based on Basal Body Temperature

- Progesterone is a temperature hormone
- After ovulation, Progesterone cause rise in temperature by 0.5 F
- This alarms when to avoid intercourse with partner
- ↑ Failure rates → require Lot of commitment & accuracy is less
- Pearl index → 60/100 women years

## FAILURE RATES

Described by PEARL INDEX

$$\boxed{\text{PEARL INDEX} = \frac{\text{Total no.of accidental pregnancies}}{\text{Total months of exposure}} \times 1200}$$

| METHODS OF CONTRACEPTION | PEARL INDEX |
|---|---|
| Vasectomy | 0.1 |
| Tubectomy | 0.2 |
| IUCD | 0.5 |
| Levonorgestrel | 0.2 |
| COCP | 0.5-0.6 |
| POP | 1-2 |
| Barriers [condoms] | |
| - Ideal usage | 9 |
| - Typical usage | 14-21 |
| Implants | 0.05 |

## LONG ACTING REVERSIBLE CONTRACEPTIVES [LARC]

- Levonorgestrel
- Implant
- Now - a - days, these are preferred over permanent sterilization procedures

## BARRIERS

- For making barriers more effective, spermicidal Jellies are used

## PROPER CONDOM USAGE

01:16:46

- Should be used on Fully erect penis
- Reservoir not be pushed over the glans & not to be checked for patency
- After intercourse, withdraw penis is fully erect stage

## IN FOLLOW UP OF MOLAR PREGNANCY

- Should not conceive for next 6 months atleast, as HCG $^{ES}$
- HCG from pregnancy & HCG From trophoblastic disease will be hard to differentiate. So, contraceptive are given for 6 months

- Contraceptive of choice
  - combined oral contraceptives
  - IUCD's not used as they can cause perforation of soften uterus due to molar pregnancy

### FOR PATIENTS WITH HEART DISEASE

- IUCDS are used [Shorter threads]
  - Monofilaments are used now
  - Polyfilaments used earlier [ ↑ risk of ascending infection]
- COCP, POP, are not given [cause water retention]

### FOR DIABETIC PATIENTS

- COCP
- IUCDS

} good

### In UNCONTROLLED DIABETICS

- Hormonal contraceptives can't be used
  - Both Estrogen & sugar are metabolized in liver
  - Increased Sugar levels can disturb contraceptives usage
- Barriers with spermicidal jellies are preferred

### In STDs / HIV PATIENTS

- Barriers with spermicidal jellies are preferred
- double barrier → both partner to wear condoms

### FOR NEWLY MARRIED COUPLE → COCP

### FOR COUPLES STAYING IN DIFFERENT CITIES

- Barriers, emergency, contraceptives, COCPs are not preferred.
- IUCDs are most preferred

### FOR POSTNATAL/ LACTATIONAL AMENORRHEA [within 6 wks of delivery]

- COCPs are not preferred as they can cause Lactational failure
- Estrogen will cause glandular proliferation → block lactiferous

ducts]

- Progesterone only pills are preferred
- Patients after 6 wks of delivery → IUCD is preferred

- UNSAFE BILIEF
  - Lactation Itself Is Protection Against Pregnancy
  - Prolactin → inhibit GnRH → FSH & LH not released → no ovulation
  - But continuous breast feeding can only prevent ovulation, which is not possible

## POST PLACENTAL IUCD

01:28:49

- IUCD inserted in uterus after removal of placenta during delivery
- During uterus contraction after delivery [Uterus involution], it may expel copper out
- But the expulsion rate is not found to be › 12% [WHO] & atleast 88% women retains IUCD

## Chapter 23

# CONTRACEPTION

FSH→ Ovary → Estrogen → Endometrial Proliferation
LH → Follicle → Progesterone → Endometrium Secretory
(Corpus Leuteum)

## HORMONAL CONTRACEPTION 00:01:00

### COMBINED ORAL CONTRACEPTIVE PILLS (C-OCP)

### MECHANISM OF ACTION

$$\begin{matrix}\text{Estrogen tablet}\\ \text{Progesterone tablet}\end{matrix} \xrightarrow[\textit{feedback}]{\textit{negative}} \ominus \left\{\begin{matrix}\textit{FSH Release}\\ \textit{LH Release}\end{matrix}\right\} \begin{matrix}\textit{No follicle}\\ \textit{development}\\ \textit{\& rupture}\end{matrix} \rightarrow \text{Anovulatory cycle}$$

- PATIENT ON C.OCP HAVE
  - Anovulatory cycle
  - Less Dysmenorrhea
  - Pill period / Artificial period
    - Have menstruation d/t ER/PR pill (not d/t natural ER/PR)
    - Have monthly periods d/t exogenous estrogen & progesteron which causes follicle proliferation & secretion respectively.
- REGULAR PERIODS
  - C.OCPs are given for 21 days and patient will have period on 28th day
- LESS BLEEDING & LESS ANEMIA
  - d/t low dose estrogen (Ethinylestradiol 0.03 mg or 30 µg), causes minimal endometrial proliferation
  - low dose pills →10 µg, 20 µg

- BENEFITS OF LOW DOSE ER PILLS
  - ↓ Endometrial cancer
  - ↓ Ovarian cancer
  - ↓ colon cancer
  - ↓ Benign Breast Disease
  - ↓ Fibroid
  - ↓ ovarian cyst
  - ↓ PID
- ADVERSE EFFECTS
  - ↑ ADENO CARCINOMA CERVIX [not squamous cell cancer (mc type of cervical cancer)]
  - ↑ SMOOTH TYPE GALLSTONES, not a/w GB cancer [mixed, pigment stones a/w GB cancer]
  - ↑ HEPATIC ADENOMA [not HCC]
  - ↑ CHLAMYDIAL PID [Indolent]

*NO EFFECT ON BREAST CANCER INCIDENCE

- USAGE
  - Started on day 1-5 of menstrual cycle
  - Quick start protocol
    - ○ Start anytime of menstrual cycle
    - ○ Mainly for low socioeconomic & teenage patient

  - Missed Pill
    - ○ Missed 1 → take 2 on next day
    - ○ Missed 2 → take pill on the day + next 7 days use another method

- CONTRAINDICATIONS

00:20:05

  - Pregnancy
  - Breast feeding
  - Deep venous thrombosis/ pulmonary embolism
  - Liver Disease : Cirrhosis, hepatitis, cancer
  - HTN > 160/100 mm Hg

- Age ≥ 35 years + smoker
- Active breast cancer
- Diabetics with neuropathy or nephropathy
- Ischemic heart disease / stroke
- Migraine with aura

*Not a Contraindication → STD/PID/HIV

- Types of OCPs 00:24:00
  - Type I → High Dose
  - Type II → Low Dose
  - Type III → NEWER PROGESTINS [ ↓ ↓ androgenic action]
    - ○ Desogestrel
    - ○ Norgestinate
    - ○ Gestodene
  - Type IV → Drospirenone

    *Actions of Drospirenone
    - ○ Progestation
    - ○ Anti - androgenic
    - ○ Antimineralocorticoid
  - Good for those with premenstrual dysphoria & acne
  - COMBINATION:
    - ○ 3 mg drosperenone & 20 mg Ethenylestradiol
    - ○ This combination will give regular cycle & good antiandrogenic action

  - Given via 24/4 Protocol, 24 days of pills & 4 days gap

MINIPILL / PROGESTERONE ONLY PILL (POP)

- Should maintain same time consumption / within 3 hours the next day

## DESOGESTREL

- Newer Minipill
- S/E → Irregular spotting
- Excellent for lactating women

## SAHELI (CENTCHROMAN)

- Developed by CDRI (Lucknow)
- Ormiloxifene → Makes endometrium out of phase & implantation is ↓ ed
- Usage → Twice/ week for 3 months, then once / week till the contraception is desired.
- S/E → Delayed cycles

## WAYS TO GIVE OCP'S

- Monophasic
  - Estrogen – up to 50µg/day
  - Progesterone – up to 1 mg/day
- Biphasic
  - Estrogen: constant
  - Progesterone: eg 11 days @ 50, 10 @ 125 µg
- Triphasic
  - Estrogen 30/40/30
  - Progesterone 50/75/125

## PERMANENT METHODS

00:35:06

Q. When to do: Sound advice (not a guide line)

A. For those with 2 children at least & last child preferably › 3 years

## FEMALE STERILIZATION

## SITE OF LIGATION ON FALLOPIAN TUBE

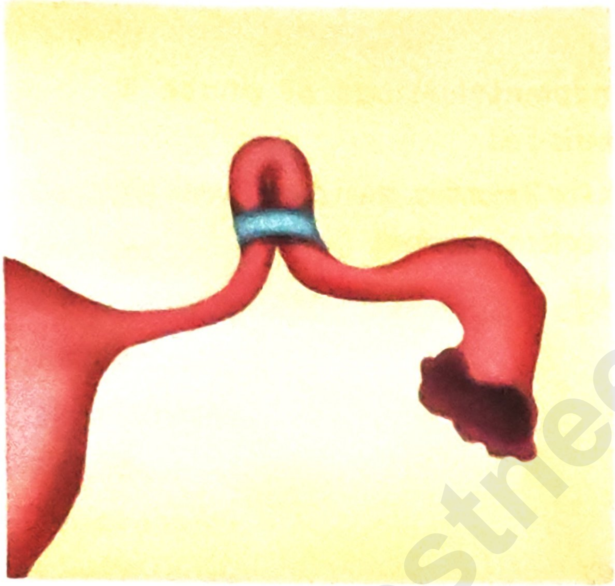
- ISTHEMIC STERILIZATION
  - Isthemo isthemic reanastamosis has up to 80% success
  - Prefer ligate at isthemic area

## TUBECTOMY

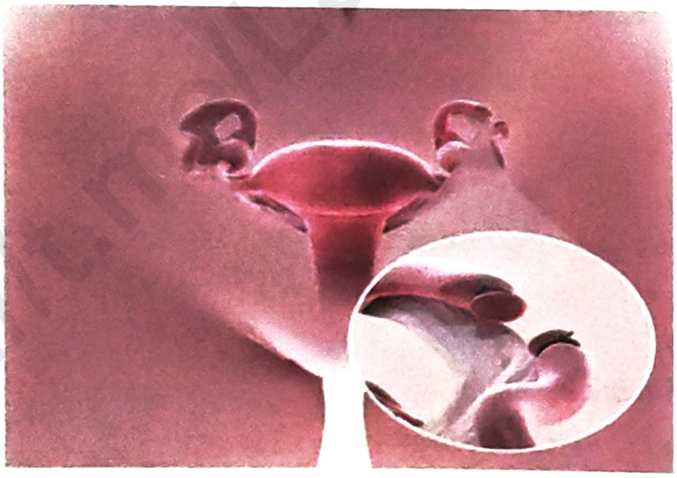
00:39:55

- MC time in India → Post partum (puerperal)
  - Immediately after delivery, uterus is at the level of umbilicus, as uterus is an abdominal organ, it is easy surgery.

TUBAL LIGATION



TUBAL LIGATION RESECTION



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- PUERPERAL STERILIZATION (PS)
  - Best done within 2-3 days after delivery
  - Upper limit is 7-10 days
  - Uterus becomes pelvic organ in → 10-14 days
  - Becomes normal organ in → 4-6 weeks

[redacted]

- INTERVAL STERILIZATION
  - Done after 6 weeks of delivery
  - Done by Laparoscopic methods

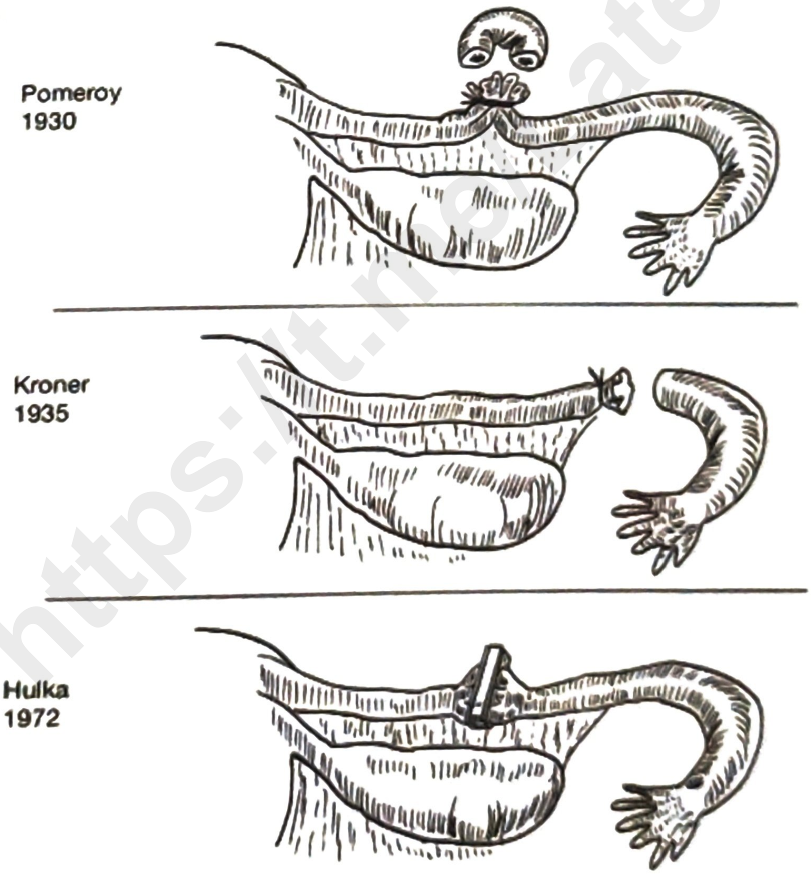
- CONCURRENT STERILIZATION
  - Done along with MTPs or cesarean section

ENTRY INTO ABDOMEN IS BY: 00:45:20

- Laparotomy [Minilap (1.5 to 2 inch incision, MC)]
- Laparoscopy
  - Mostly for interval sterilization
  - Never do in puerperium
    - ○ Can cause injury
    - ○ Failure chances are more

      (As the tube is edematous & the ring may slip from the tube)

## TECHNIQUES



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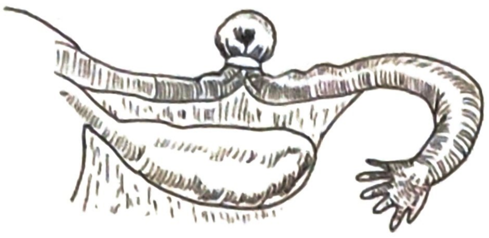


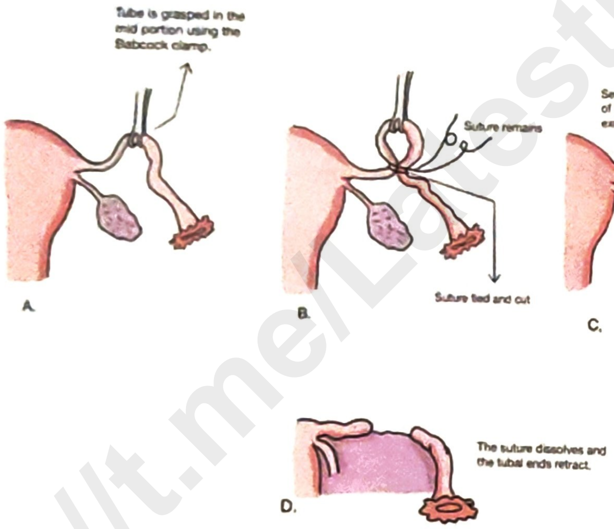
Falope Ring
1974

## TECHNIQUES OF TUBECTOMY

00:48:30

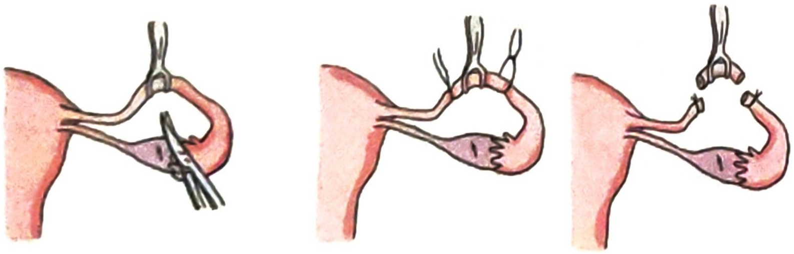
- Pomeroy Techniques
  - Most commonly done
  - Single ligature is used
  - Tube cut end are together
  - Can lead to fistula formation

POMEROY PROCEDURE


Tube is grasped in the mid portion using the Babcock clamp.
A.
Suture remains
Suture tied and cut
B.
Segment of tube excised
C.
The suture dissolves and the tubal ends retract.
D.

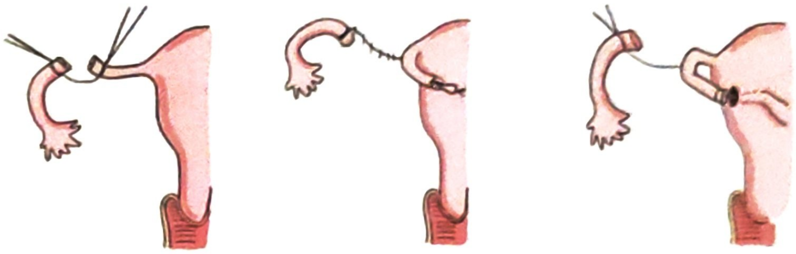
- Parkland Technique
  - Double ligature is used
  - Tubes are ligated separately

PARKLAND



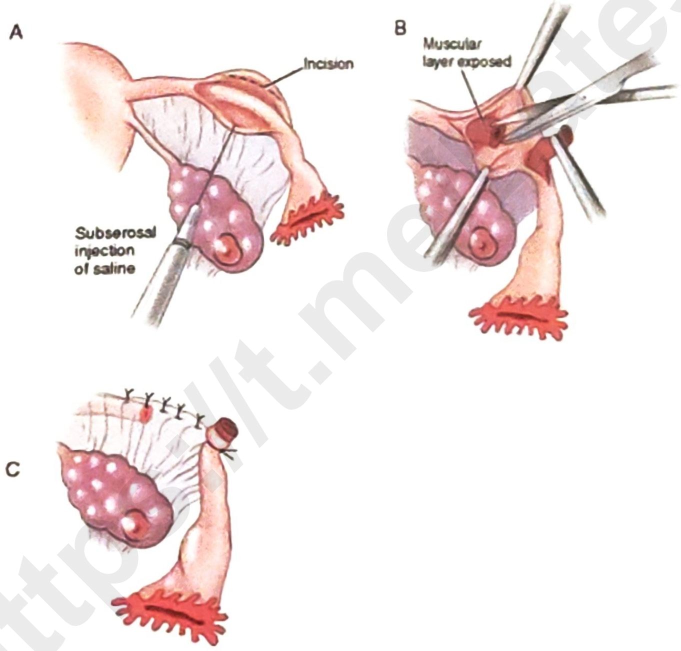
- Irwing Procedure
  - One end of tube is anastamosed into uterine musculature
  - Other end of tube is anastamosed into mesosalpinx

IRWING



- Sub Mucosal Disection of Tube (UCHIDA'S Procedure)
  - Serosa is lifted by needle & saline is injected
  - Then serosa is incised and tube is resected
  - Serosa is sutured again
  - Fibrosis & adhesions are very less, as cut ends are within the serosa.

UCHIDA'S



- Madlener's Method
  - Tubes are crushed, not resected.
  - High failure rates, not done these days.

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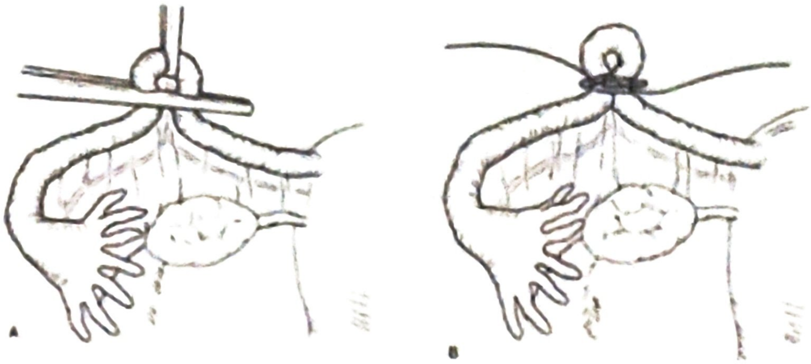
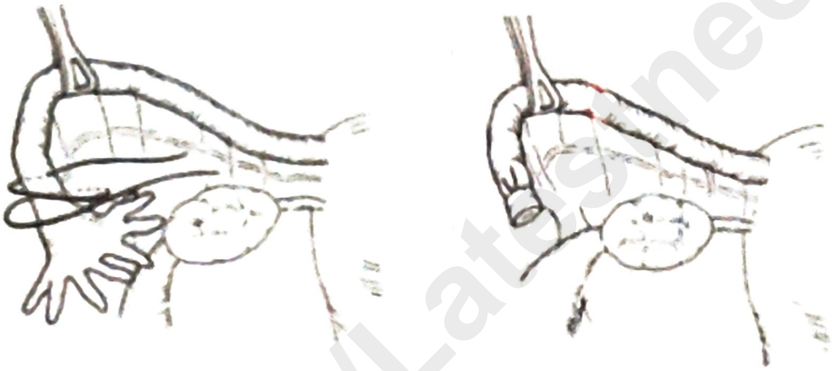
MADLENER



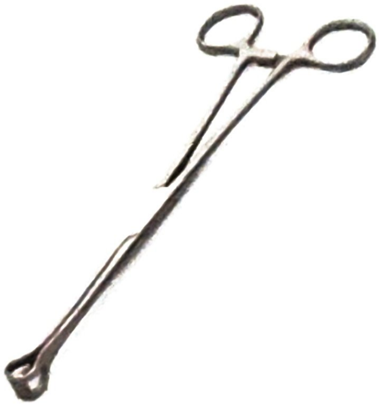
- Kroner's Fimbriectomy
  - No reversal is possible
  - Not done these days

KRONER



- Basic Steps To Follow To Avoid Ligating Other Structures:
  - After pulling out the structures with BABCOCK'S FORCEP (atraumatic grip), always look for fimabriae and then ligate

BABCOCK'S FORCEP



- Structures Ligated by mistake
  - Round ligament (MC)
  - Small bowel
  - Ovarian ligament
  - Appendix
  - Ureter
  - Uterine artery

} Can't be ligated by mistake as they are retroperitoneal

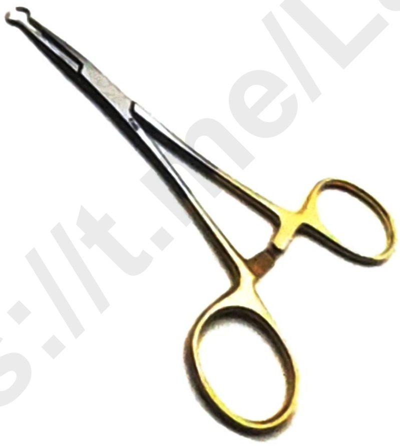
*Failure rate of tubectomy is more than vasectomy

## VASECTOMY

00:59:27

- Failure rate lesser than tubectomies
- Non scalpel vasectomy can be done
  - We stabilize (ring forcep, pull out the vas deferens with sharp artery forcep and ligate it.
- T. Bandage for scrotal support
- Avoid heavy weight lifting

RING FORCEP



## SIDE EFFECTS

- Dragging pain
- Hematoma
- Infections →Epidydimytis
- Sperm build up
- Antisperm antibody can be form

*Sperm present in part distal to ligation can still cause pregnancy

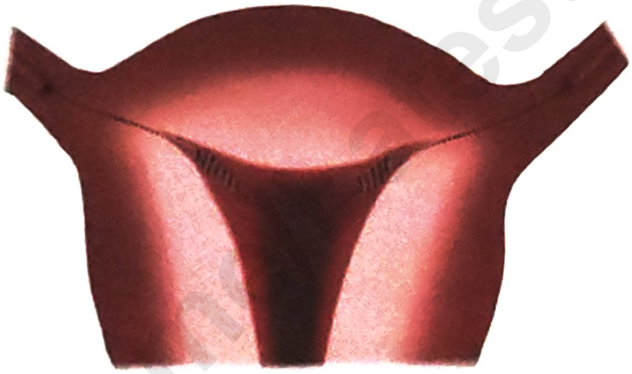
- For 3 months or 20 ejaculations, whichever is later → use barriers or other contraceptives
- After 3 months, sterilization should be confirmed by semen analysis. It should show azoospermia.

## ESSURE RING

01:08:23

- Hysteroscopic implant of Essure Ring
- Made up of Nitinol (Alloy of Nickel & Titanium)
- Causes Fibrosis & blockage of tube
- Can be done under LA & GA
- Takes 3 months to completely block the tube
- Hysterosalpingography done to confirm blockage

ESSURE RING



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## Contraception in Peculiar Conditions 01:16:43

### Molar Pregnancy

- Cyclic OCP are given as a method of contraception
- Avoid IUCD for contraception as these may lead to perforation inside Uterus

### Heart diseases:

- Avoid OCP as the Hormones can lead to water retention

### Diabetes Mellitus

- Both IUCD & OCP can be given in controlled DM

### Uncontrolled DM

- Condom (Barrier Method) with Spermicidal Jelly

### Newly married couple

- Combined OCP

### Couple in separate cities having occasional intercourse

- IUCD

### Lactational Amenorrhea

- Progesterone only pill (POP)

### After 6 wks Puerperium

- IUCD

### STD

- Barrier with Spermicidal Jelly

### Heart Disease

- Give IUCD

## Chapter 24

# GENITAL TRACT INFECTIONS

### ASHERMAN SYNDROME

ETIOLOGY 00:02:14

- OVERZEALOUS CURRETTAGE done For
- – AUB (Abnormal Uterine bleeding)
- – MTP
- – Secondary PPH [d/t retained bits of Placenta]
- – Causes scarring & Fibrosis of endometrium [no gland development Further]
- – Leads to secondary amenorrhea → ASHERMAN SYNDROME

- ENDOMETRIAL TB → also causes ASHERMAN SYNDROME

  Currettage Done For 2° PPH Is More Likely To Cause Asherman Syndrome

TREATMENT

- Hysteroscopic Adhesiolysis
- Followed with High dose Estrogens & Progesterone

### TUBERCULAR PID 00:07:24

- Incidence → 20-25% of women in India

PATHOGENESIS

- Endometritis → Menorrhagia [Initially]

  ↓

  Endometrial destruction

  ↓

  ASHERMAN SYNDROME → Oligomenorrhea

  → Hypomenorrhea

→ Amenorrhea [mc]

- Fallopian Tube
  - Calcific, beaded, rigid tube
  - Hydrosalpinx → Tobacco Pouch Hydrosalpinx
  - Retort Shaped Hydrosalpinx

## TREATMENT 00:13:30

- 4 Drugs for 2 months &
  3 Drugs for 4 months
- Do not stop the Rx in 1st trimster

## PELVIC INFLAMMATORY DISEASE

### CAUSES 00:15:16

- Chlamydia → most prevalent ; Indolent
- Gonorrhea → most common in OPD
- Mycoplasma
- TB
- Ureaplasma
- Bacteroids
- Pepto streptococcus
- Bacterial vaginosis [important cause]
- Streptococcus

## CLINICAL FEATURES

### SYMPTOMS 00:20:57

- Pain abdomen
- Congestive dysmenorrhea
- Dysparunia
- Fever

### SIGNS 00:23:30

- Febrile
- ADMIT IF:

  - Temp > 38°C/ 100.4°F
  - Severe Symptoms
  - Suspicious pelvic abscess
  - Unreliable
  - Uncertain diagnosis
- ↑ CRP
- Leucocytosis
- on P/v
  - cervical motion tenderness
  - Uterine tenderness
  - Adnexal tenderness

} CLINICAL TRIAD
helps in Diagnosis

Cervical motion Tenderness Also Be Seen In Ruptured Ectopic Pregnancy

Diagnosis

ADDITIONAL CRITERIA 00:26:44

- CULTURE & SENSITIVITY OF
  - Endometrial Biopsy
  - Vaginal swab
  - Cervical Swab
  - Culture MEDIAS For
    - GONORRHEA → Thayer martin media
    - CHLAMYDIA → Mc coy cell lines [PCR Preferred]

- ↑ ESR/ CRP
- ↑ TLC
- FEVER > 100.4°F [38°C]

ELABORATE CRITERIA 00:29:30

- DIAGNOSTIC LAPAROSCOPY
  - gives direct evidence
  - Laparoscopy "IF DONE" is the best way to diagnose PID
- USG → documents pelvic/tubo ovarian abscess

DISCHARGE CRITERIA → Temperature <99.5°F

TREATMENT

- CENTRE FOR DISEASE CONTROL OF ATLANTA 00:32:55
  - IN PATIENT REGIMES
  - OUT PATIENT REGIMES

- BROAD SPECTRUM ANTIBIOTICS 00:33:56

OPD REGIME

- CEFOXITINE 2gm iv or
  CEFOTAXIME 1gm iv } 1 shot For gonorrhea
- DOXYCLINE 100 gm BD x 14 Days → For chlamydia
- METRONIDAZOLE 500 mg BD x 14 Days
  - For anaerobes
  - For bacterial vaginosis
- AZITHROMYCIN can be given instead of DOXYCYCLINE
- CLINDAMYCIN can be given instead of METRONIDAZOLE

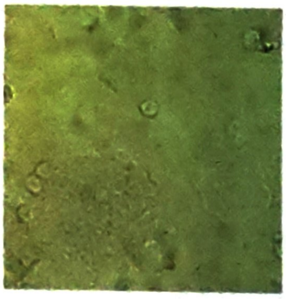
VAGINITIS 00:38:44

Ph of Vagina
Candidiasis → can occur in acidic ph of 4.5
Bacterial vaginosis } can occur in Alkaline PH [<7]
Trichomoniasis } Alkalinity Shift also predispose [5.5 or6]

AMSEL'S CRITERIA

- Useful in Dx of Bacterial vaginosis
- 3 out of 4 are required

1. Creamy discharge
2. WHIFF TEST
3. Fishy odour
4. CLUE CELLS

| ACIDIC PH | ALKALINE PH > 4.5 | |
|---|---|---|
| CANDIDIASIS | BACTERIAL VAGINOSIS | TRICHOMONIASIS |
| • DIMORPHIC FUNGI<br>Blastospores [Spreads]<br>Mycelia [Invasion & adherence]<br>• Curdy white discharge, plaque on vaginal wall on removal causes Petechiae<br>• Out of proportion PRURITIS<br>• Complicated / uncomplicated<br>Uncomplicated<br>– seen in Ⓝ women<br>– Good prognosis<br>– a/w albicans<br>Complicated<br>–In immunocompromised [in DM, TB, pregnancy etc]<br>– Recurrent, Severe<br>– a/w non-albicans<br>• TREATMENT<br>– AZOLES<br>– Oral FLUCONAZOLE<br>– Rx both male & female | • Hemophilus vaginalis aka Gardenella vaginalis<br>• Creamy discharge<br>• WHIFT TEST → +ve<br>- Secretion + 10% KOH → amines<br>• Fishy odour<br>• CLUE CELLS - vaginal epithelium with embeded bacteria<br><br>CLUE CELLS<br>• NO PRURITIS<br>• TREATMENT<br>– METRONIDAZOLE<br>– Rx the Women [no sexual transmission] | • by Trichomonas vaginalis Flagellate protozoan<br>Motile organism cause severe irritation & severe pruritis<br>• COLPITIS MACULARIS [STRAWBERRY VAGINA]<br>• Greenish yellow, Froathy discharge<br>• TREATMENT<br>- METRONIDAZOLE<br>- Rx both man & women |

- MC VAGINITIS → BACTERIAL VAGINOSIS

BACTERIAL VAGINOSIS can cause

- PID
- Relapse of PID
- Chorioaminionitis [PID in pregnancy]
  - Abortion
  - IU Death
  - Puerperal sepsis
- vault cellultis

- WHIFF TEST CAN ALSO BE POSITIVE IN TRICHOMONIASIS
  - As both Bacterial vaginosis & Trichomoniasis CO-Exists .
  - Classical For Bacterial vaginosis

- Rx the male partner also in Trichomoniasis
- Rx the male partner also in candidiasis
- Rx only women in B Vaginosis (as not STTD)

# Chapter 25

# AMENORRHEA

Amenorrhea 00:00:50

Primary Amenorrhea → No periods ever

Secondary Amenorrhea → No periods x 3 cycles (3 months)/ 6 months

PUBERTY → Normal 10-12 yrs

DELAYED PUBERTY 00:02:00

- No periods till 13 yrs

Secondary sexual characters absent

OR

- Secondary sexual characters present

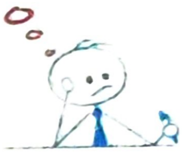
No periods till 15 yrs

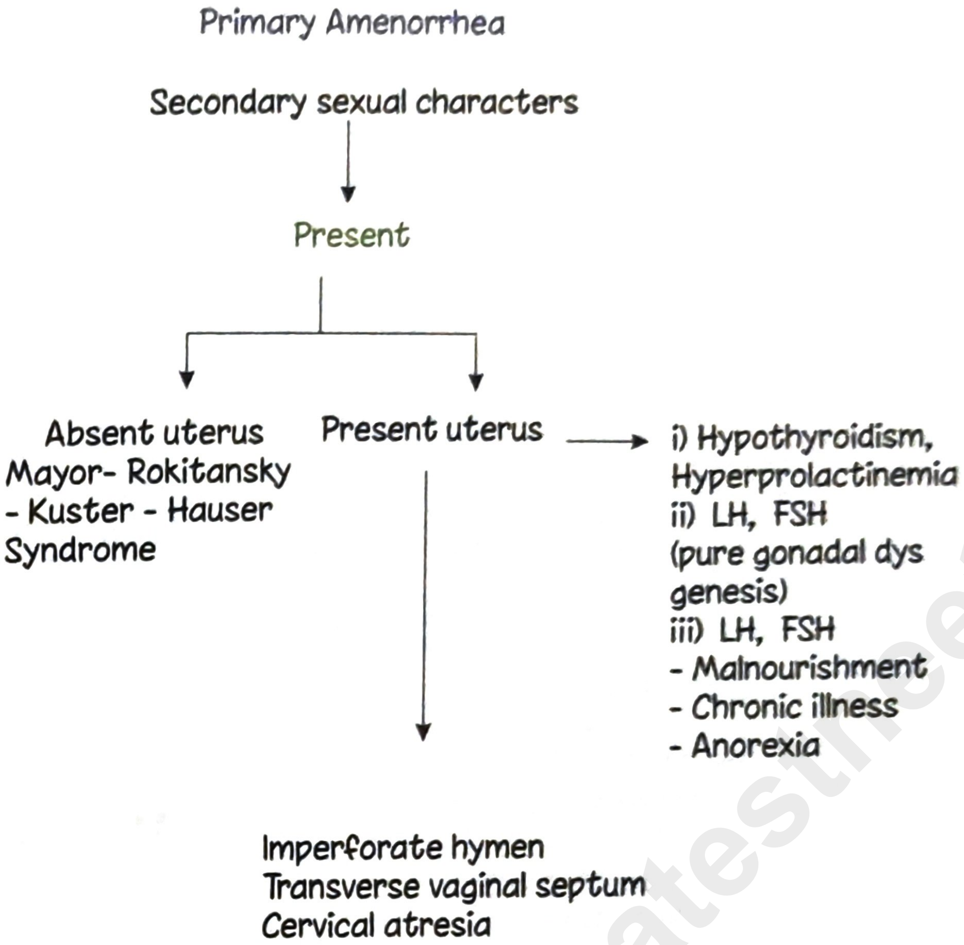
INVESTIGATIONS 00:03:46

No periods:

- Pregnancy test negative
- O/E:
  Breast examination
  Axillary, pubic hair
  Vagina
- P/V:
  Uterus examination
- Tests including: LH, FSH, TSH, PRL, karyotype

## PRIMARY AMENORRHEA 00:06:00





Primary Amenorrhea

Secondary sexual characters

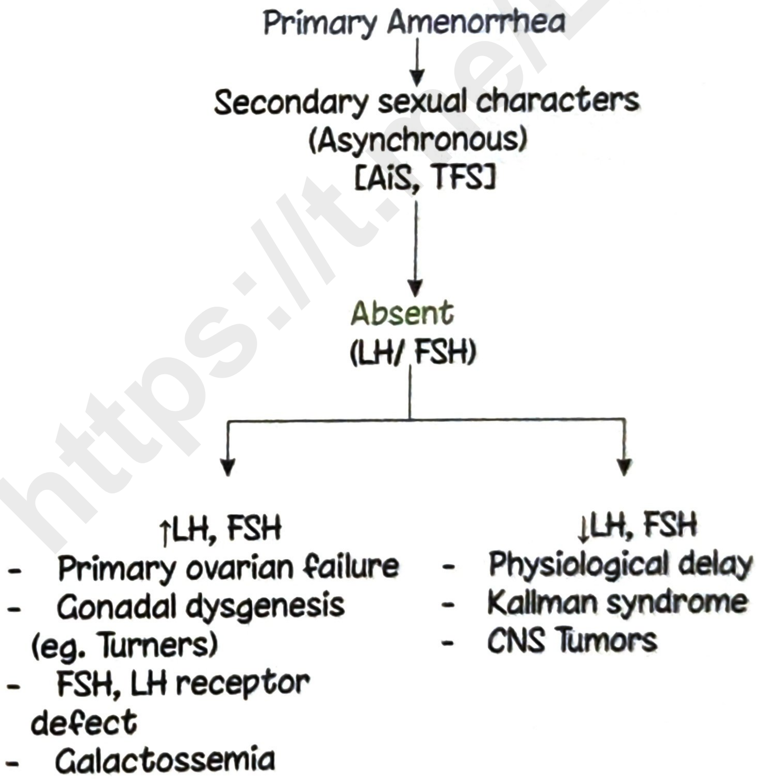
Present

Absent uterus
Mayor- Rokitansky
- Kuster - Hauser
Syndrome

Present uterus

i) Hypothyroidism,
Hyperprolactinemia
ii) LH, FSH
(pure gonadal dys genesis)
iii) LH, FSH
- Malnourishment
- Chronic illness
- Anorexia

Imperforate hymen
Transverse vaginal septum
Cervical atresia



Primary Amenorrhea

Secondary sexual characters
(Asynchronous)
[AiS, TFS]

Absent
(LH/ FSH)

↑LH, FSH
- Primary ovarian failure
- Gonadal dysgenesis (eg. Turners)
- FSH, LH receptor defect
- Galactossemia

↓LH, FSH
- Physiological delay
- Kallman syndrome
- CNS Tumors

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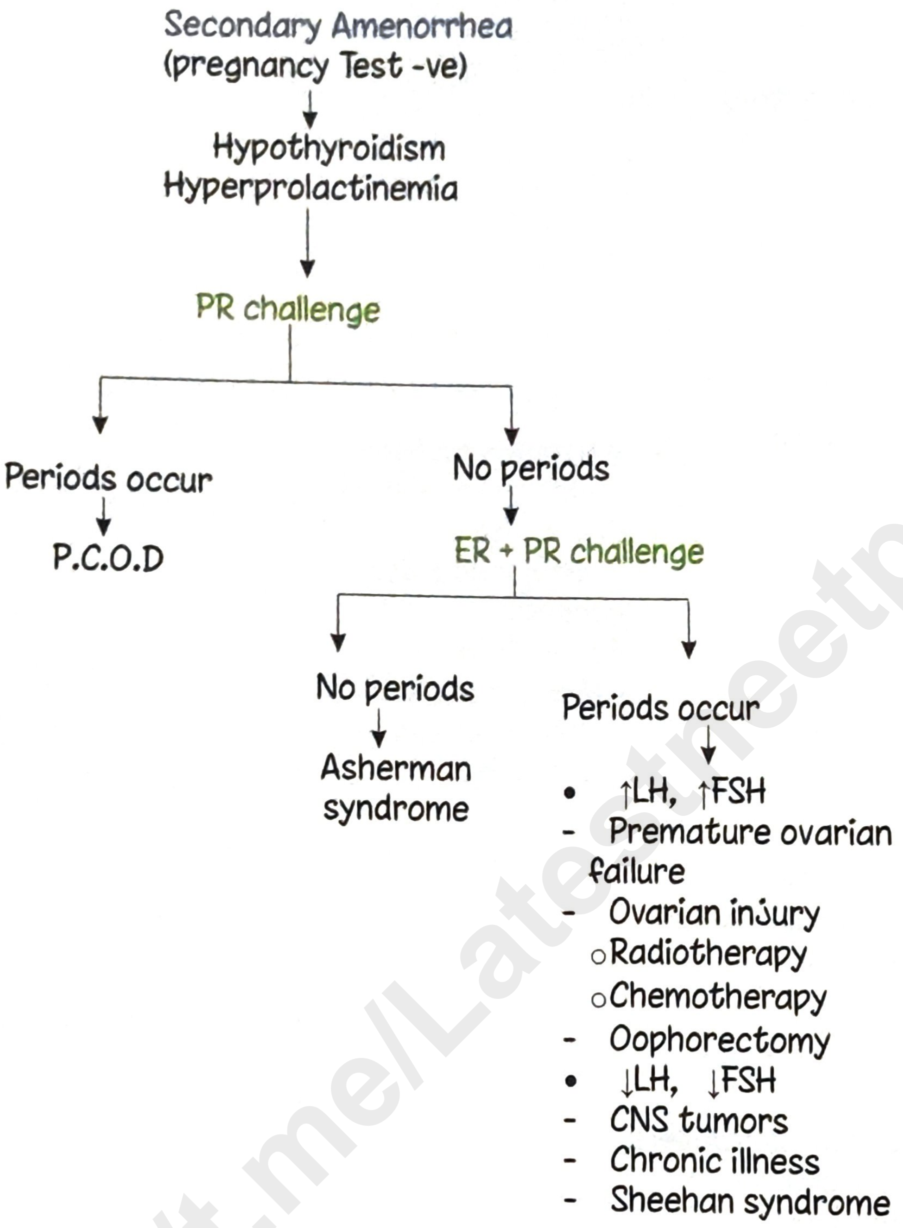
## SECONDARY AMENORRHEA

00:13:21



Secondary Amenorrhea
(pregnancy Test -ve)
↓
Hypothyroidism
Hyperprolactinemia
↓
PR challenge

Periods occur
↓
P.C.O.D

No periods
↓
ER + PR challenge

No periods
↓
Asherman syndrome

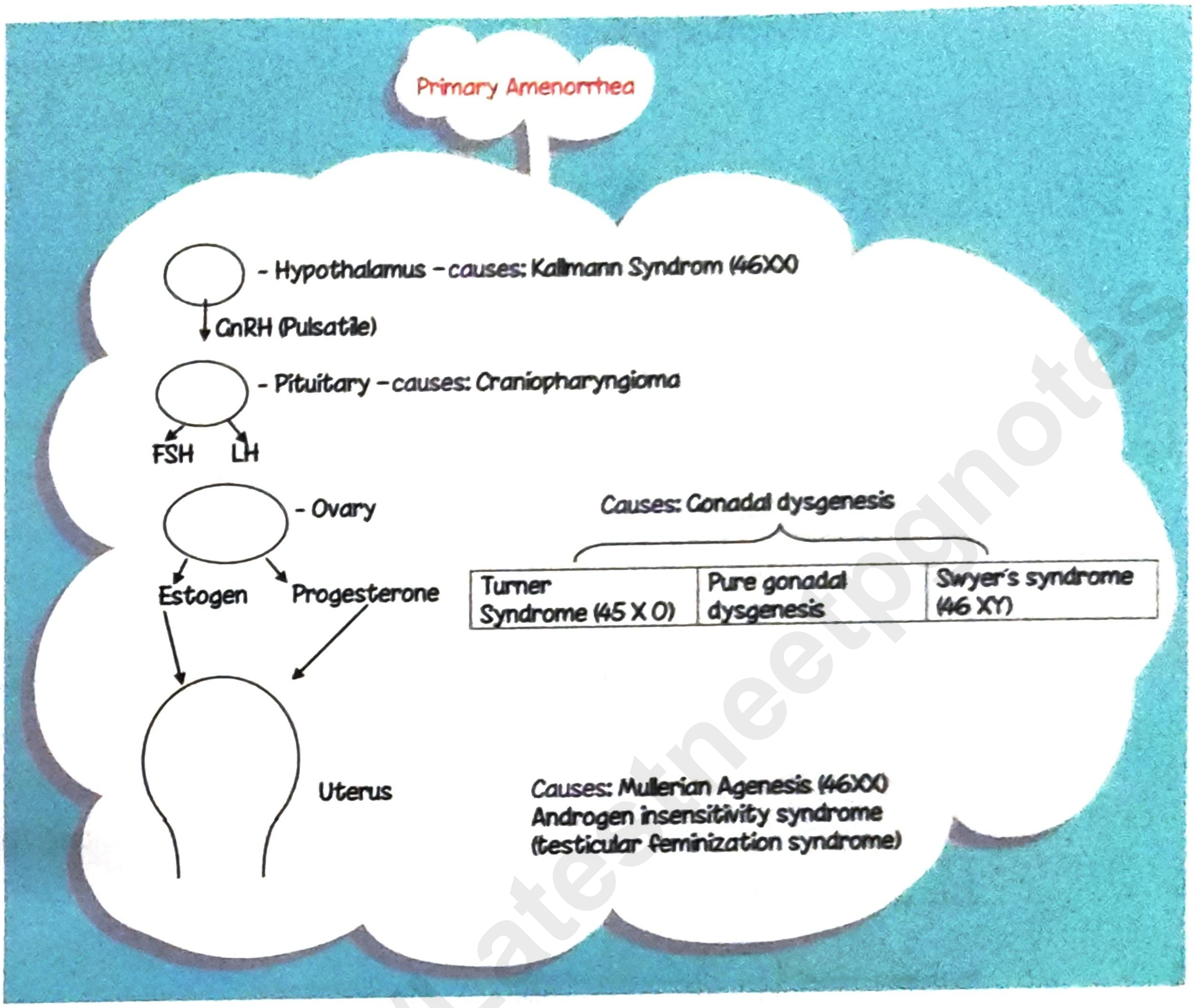
Periods occur
↓
- ↑LH, ↑FSH
  - Premature ovarian failure
  - Ovarian injury
    - ○Radiotherapy
    - ○Chemotherapy
  - Oophorectomy
- ↓LH, ↓FSH
  - CNS tumors
  - Chronic illness
  - Sheehan syndrome

## COMMON ETIOLOGY

00:21:30

- Pregnancy
- Hypothyroid/ Pitutary tumors
- Chronic illness
- Hyperprolactinemia
- Empty sella syndrome
- Thyroid disease
- PCOS/C CAH
- POI
- Cushing syndrome

## Primary Amenorrhea


- Hypothalamus - causes: Kallmann Syndrom (46XX)
GnRH (Pulsatile)
- Pituitary - causes: Craniopharyngioma
FSH
LH
- Ovary
Estogen
Progesterone
Uterus

Causes: Gonadal dysgenesis

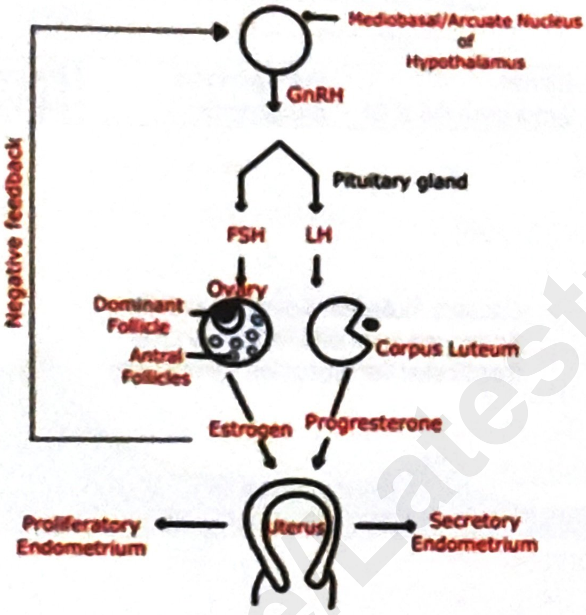
| Turner Syndrome (45 X O) | Pure gonadal dysgenesis | Swyer's syndrome (46 XY) |
|---|---|---|

Causes: Mullerian Agenesis (46XX)
Androgen insensitivity syndrome
(testicular feminization syndrome)

## Chapter 26

# DRUGS USED IN GYNAECOLOGY AND OBSTETRICS

### Basics of Menstrual Physiology 00:00:36



### Drugs For Ovulation Induction 00:02:02

1. METFORMIN 00:02:51

- Oral biguanide
- Dose: 500-1000 mg B.D
- Insulin sensitizer
  - ↑peripheral uptake of insulin
  - ↓Hepatic gluconeogenesis
- Used for ovulation induction

2. CLOMIPHENE CITRATE (SERM) 00:05:13

- Racemic mixture of:
  - Enclomiphene 62% (Anti ER)
  - Zuclomiphene 38% (Mild ER)

In case of PCOS

Clomiphene citrate

↓

ER Receptor blocker

↓

↑ Pituitary stimulation

↓

↑ FSH

↓

1 or 2 follicles will grow

↓

Ovulate

- It is a hypothalamic ER receptor blocker
- Dose: 50 mg-100mg

  From 2nd to 6th day of periods.

  Ovulation rate is 80%

  Pregnancy rate is 40%

S/E:

- vasomotor flushing
- mood swings
- Pelvic discomfort
- Nausea, vomiting
- Visual scotomas

## 3. Letrozole

00:10:00

- Aromatase inhibitor
- Vs. C.C. has: ↓ ↓ S/E

  ↓ ↓ Twins

S/E: - locomotor defects

- Cardiac defects

In fat cells: Androgen

↓ Aromatase (Letrozole ✗)

↓↓ estrogen

- DOC for ovulation induction
- Dose: 2.5 to 5 mg/day
  From 2nd to 6th day of periods

4. Inj: FSH
   - ○ Purified FSH
   - ○ Recombinant FSH

Inj HMG
- ○ 75 IU FSH
- ○ 75 IU LH

(HMG: from urine of post-menopausal women)
- In menopausal women: ↑ FSH, ↑ LH in circulation & in urine

In IVF:

Ideal – 6-15 eggs

At least – 3 eggs

TO GET MORE EGGS FOR IVF
- Give Inj. FSH in the beginning of the cycle till 14th day.

↓

Follicles will grow in size

↓

LH surge will come much earlier (<14 days)
(while the follicles are still small)

↓

& the cycle gets wasted

To prevent this early LH surge

↓

Suppress pituitary

↑

Give GnRH analogues in the previous cycle.

* Analogues are given in depot form

GnRHa (Analogues) 00:29:24

- Leuprolide acetate – 20-40 times more potent than native
- Triptorelin – 130 times
- Buserelin – 80-100 times

Other uses:

- Ovulation induction
- Suppressing hormone-based tumor → prostatic cancer
- Precocious puberty

GnRH Antagonist 00:33:50

- Competitive inhibition of pitutary receptors of GnRH
- Cetorelix
- Ganirelix
- Given around 6th day till 14th day of cycle
- Will suppress pre-mature LH surge

OXYTOCIN 00:38:06

- Nano peptide
- Released from post. Pituitary
- ½ life: 2-3 minutes
- Duration of action: 20-25 min

Uses:

- Abortion: in 2nd trimester with PG's
- Not in 1st trimester
- Induction of labour
    - 5 IU in 500 ml R.L, 8 drops / minute
    - Or infusion set → pump
    - Given half the dose for multigravida's as compared to primigravida.
- PPH prevention: DOC
    - Dose for prevention: 5-10 IU I.M/I. V bolus
    - Dose for Rx: 10-20 IU IV infusion
- For contraction stress test
    - Induce contraction (not in labor) & see response of F.H.R & this gives indication if women can have normal delivery or not

S/E: - water retention – water intoxication
(Anti diuretic effect)

- In multigravida → rupture of uterus
- Hyper stimulation → 45 sec contraction once in every 3 minutes (lot of contractions)
- Fetal distress/ death (d/t hypertonic contractions)

METHYLERGOMETRINE 00:49:45

- Ergot derivative → from fungus → Claviceps purpurea
- Vial: 0.25 mg inj. Given IM/IV
- Tab: 0.5 to 1 mg

Uses:

- For prevention of PPH 0.25 mg IV/IM (D.O.C oxytocin)
- For Rx of PPH
- IV. Inj:
    - acts within 90 seconds
    - S/E of sudden hypertension
    - Give slow push & not as a sudden bolus shot

    - Up to 3-4 inj. In 24 hrs.
    - Maintain by tablet 0.5 mg T.D after 24 hrs.
- I.M in. takes around 10 min. to act
    - C.S: intraoperative bleeding
    - post abortal bleeding

**Never used for:**

- induction of abortion
- Induction of labour

**C/I:**

- not given in before 2nd twin is delivered
- PIH (↑ B. P)
- Heart diseases
- Rh iso immunization

**S/E:**

- Nausea, vomiting
- Sudden hypertension
- Gangrene of toes

## PROSTAGLANDINS

01:01:02

- Derivatives of prostanoic acid which is made from P.U.F.A
- Used for
    - Induction of abortion
    - Induction of labor
    - Rx of PPH

*Unlike oxytocin, PG's can be used throughout the gestation

## PG's USED FOR ABORTION

$PGE_1$: misoprostol

- Tablet form

Can be given:

- orally 200 μg
- vaginally 600-800 μg
- rectally

$PGF_{2\alpha}$: carboprost:

- injection
- IM only
- Never given I.V

### PG's USED FOR I.O.L

- Dianoprostone: $PGE_2$
  - In gel form: 0.5 mg
  - Intravaginal, intra cervical

### PROPESS (Dianoprostone pessary)

- Dose: 10 mg

### PG's for PPH Mx

$PGE_1$: Misoprostal

  - Orally: 200 μg
  - Rectally: 800 μg

$PGF_{2\alpha}$: carboprost

- "Go to" drug
- Dose: 25 μg IM
- Maximum up to 8 injection / 24 hrs. (2 mg)

S/E of PG's usage:

- Hypersensitivity reaction
- Bronchospasm – $PGF_2\alpha$
- Hyper stimulation of uterus "Tonus"
- Nausea, vomiting
- Diarrhea
- Uterine rupture in abortions or if used in previous C.S

## ANTI-HYPERTENSIVE DRUGS

### Methyl dopa
01:16:51

Pro drug → α methyl norepinephrine

Stimulates $\alpha_2$ adrinergic system → ↓↓BP by ↓sympathetic Outflow

Inhibits, dopa carboxylase

↓

↓↓ dopamine

↓↓ adrenaline

Dose: 250 mg q.i.d

Upto 500 mg can be given

S/E

- Drowsiness
- Depression
- False +ve coomb's test

### HYDRALAZINE
01:20:04

- Arteriolar dilator
- Orally: -
  - 25 mg. up to 100 mg
  - Given in 4 doses /day
  - I.V 5 to 10 mg

S/E

- Hypotension
- Tachycardias
- Arrhythmias

### LABETOLOL
01:21:37

DOC

- In chronic hypertension
- Hypertension of pregnancy (BP increasing after 2 week of

pregnancy)

- $\alpha+\beta$ blocker
- Dose: 100 mg T.I.D, up to 200 mg T.I.D
- If orally, up to 2400 mg / 24 hrs.
- I.V: DOC for hypertensive emergencies
    - 20 mg I.V → 40 mg I.V → 80 mg I.V
    - up to 220 mg (300 mg) I.V in 24 hrs.

S/E

- Headaches
- CHF
- Bronchial asthma

### NIFEDEPINE 01:24:41

- Ca ++ channel blocker
- Vasodilatation
- Dose: 5 mg to 10 mg q.i.d
- up to 80 mg

S/E:

- Sudden Hypotension
- Tachycardia
- Headaches

### NITROGLYCERINE 01:27:43

Drip → infusion pump

Dose → 5 μg /min

Up to 80 μg /min

S/E:

- Hypotension
- Tachycardia
- Meth hemoglobinemia
- Headaches

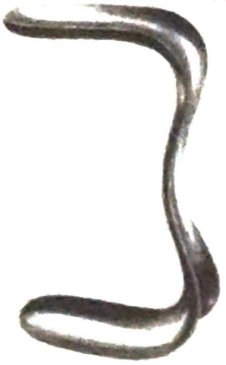
## SODIUM NITROPRUSSIDE 01:29:37

- Emergency situations
- Can cause cyanide toxicity to the fetus
- Used for short period, preferably avoided.

## Chapter 27

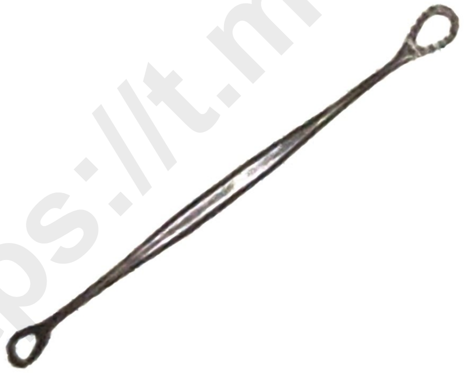
# INSTRUMENTS IN GYNAECOLOGY & OBSTETRICS

### SIMS SPECULUM (DUCK BILLED SPECULUM) 00:01:01



- Inspection & Examination of vagina and cervix
- Examination of obstetric trauma or vaginal trauma
- Used for DNC
- 2 blades of different sizes
- Trough

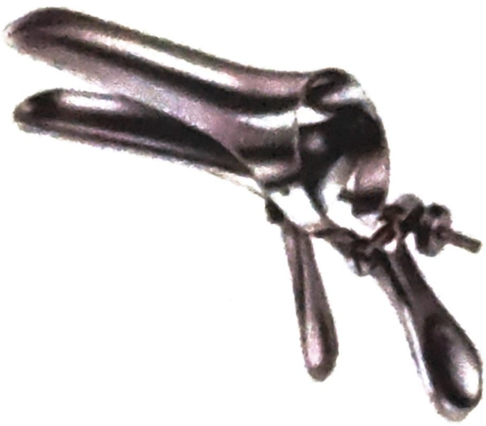
### SIMS ANTERIOR VAGINAL WALL RETRACTOR 00:03:18



- Retraction of vagina to expose the cervix
- Also for a Curretage
- Spoon shaped ends
- Transverse serrations

## CUSCOS SPECULUM

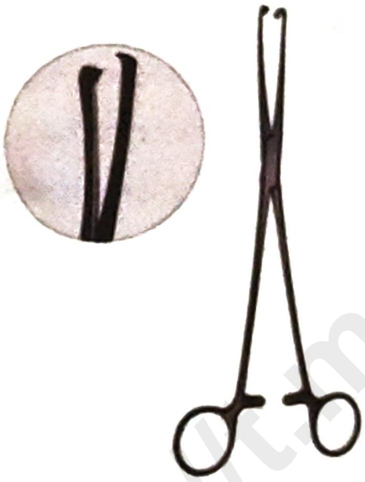
00:04:56



- 2 blades connected by a Hinge
- Just like sims, but is Self retaining
- Colposcopy, Cx Biospy, IUCD insertion & Removal, Embryo transfer
- Take up too much space in the vagina
- Not useful for doing surgical procedures

## TEALE'S VULSELLUM

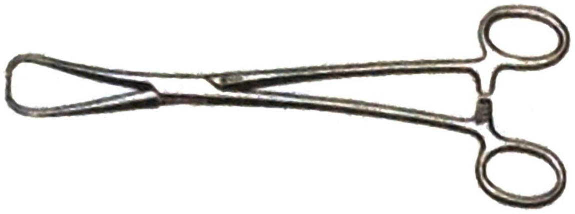
00:07:27



- 2 by 3' teeth
- To hold: Anterior and Posterior cervical lips
- For traction in surgeries like Colpocentesis, Colpotomy
- Used for Surgeries like Biopsies, Amputation, Electro and Cryo Cauterization
- Endometrial Biopsies and Curettage

## JARCHO TENACULUM

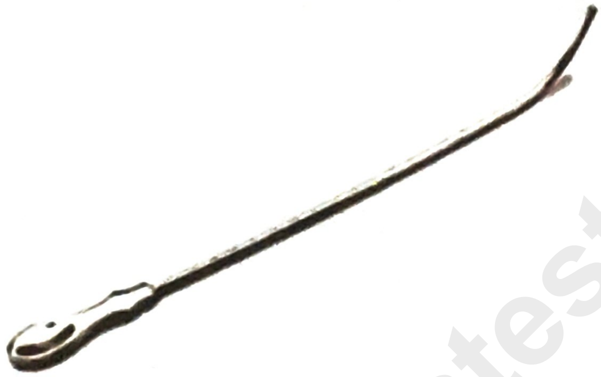
00:12:44



- Single Tooth at the end of each Blade
- More secure as the bite is deeper
- But more traumatic, especially with Novices!

## SIMPSONS UTERINE SOUND

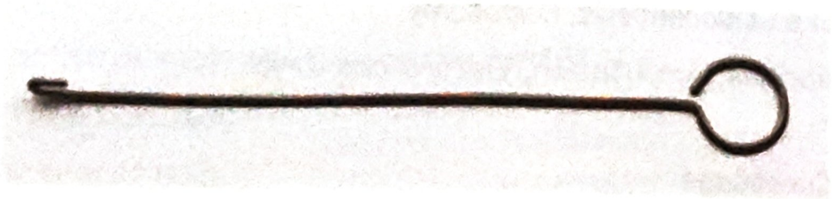
00:13:56



- To find out the depth of the uterus
- Angle of 15°
- To measure: Utero-cervical Length
- Find if uterus is Anteverted or Retroverted
- For Situations like Missing IUCDS, asses malformations of the uterus, Stress incontinence diagnosis

## IUCD REMOVING HOOK

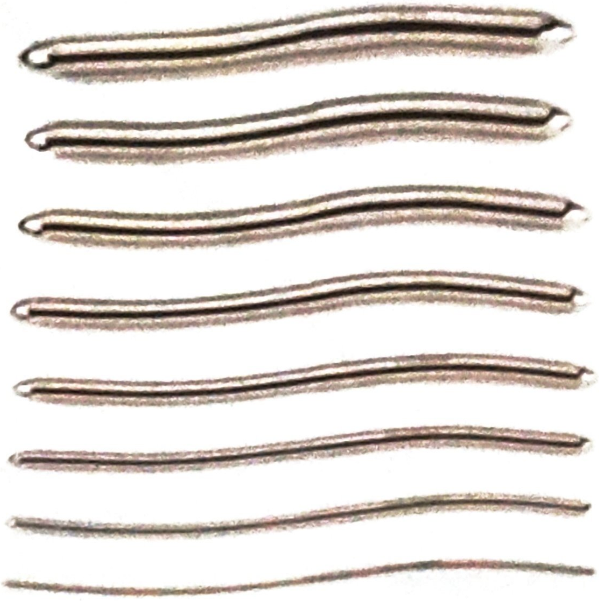
00:18:01



- For lost IUCD's (because the thread is missing)

## HEGARS DILATOR

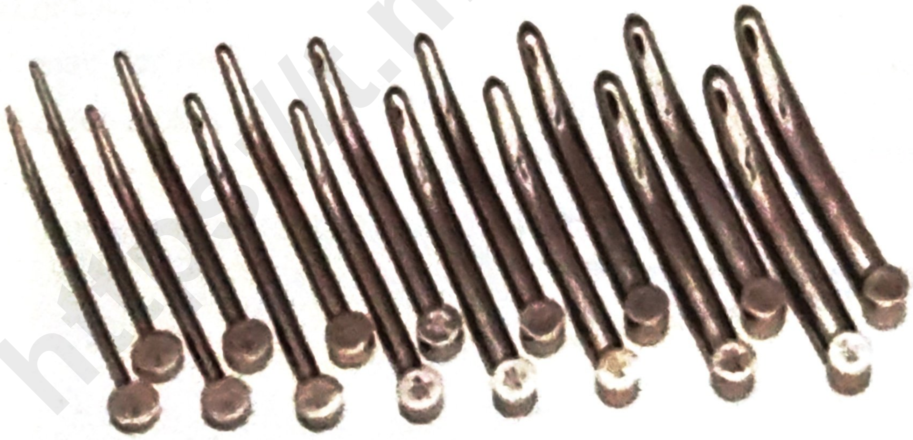
00:19:18



- Single or Double ended
- Numerous Procedures
  - Cervical stenosis
  - Removal of IUCD's
  - Suction evacuation, DNC
  - Intra Uterine radiations source application
  - Drainage of Hematometra, Pyometra

## HAWKIN AMBLERS DILATOR

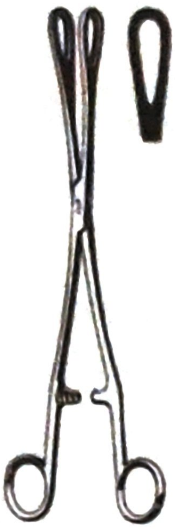
00:20:49



- Better than Hegar's dilator
- It has got a holder & causes less injuries

## SPONGE HOLDING FORCEPS

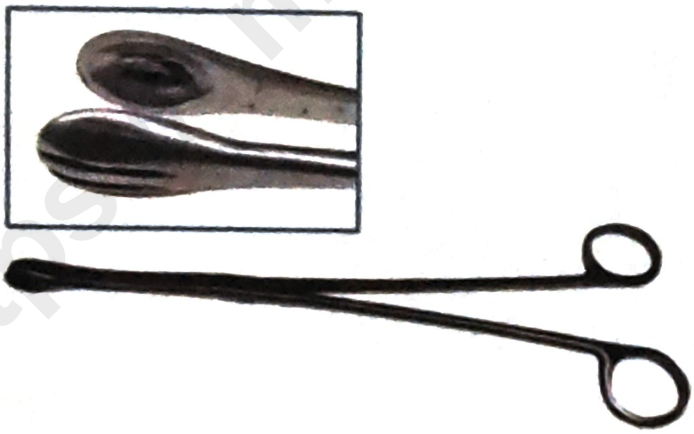
00:22:23



- It is used for application of Betadine before surgeries
- For preparations of Abdomen, Vulva, Vagina
- A ratchet Catch
- Pressure for Hemostasis
- Blunt Dissection
- Hemostatic Clamp
- Cervix Examination
- To Hold the cervix for Encerclage
- Ring forceps is better

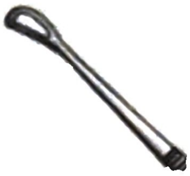
## HAYWOOD SMITHS OVUMS FORCEPS

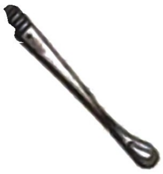
00:26:26



- Similar to sponge holding forceps
- Does not have a lock
- The blades are cupped

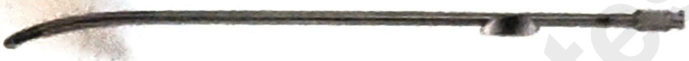
## BLAKES UTERINE CURRETTE 00:28:18

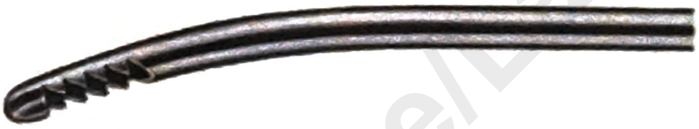




- AUB not responding to treatment
- Curettage in MTP
- Diagnosis of Disease:
- Eg. TB, Endometrial Cancer
- Diagnosis of Infertility cause
- Endometrial Dating

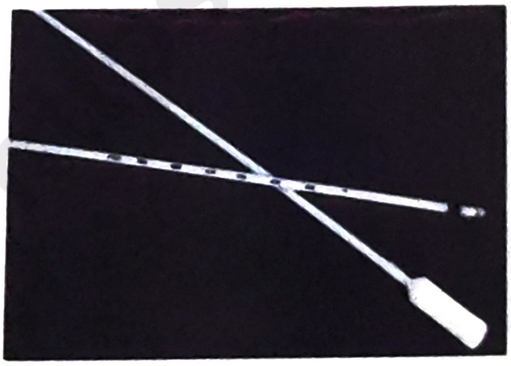
## RANDALL's ENDOMETRIAL BIOPSY CURRETTE 00:29:55





- Has got serrated top
- Not used for MTT
- Similar to blakes

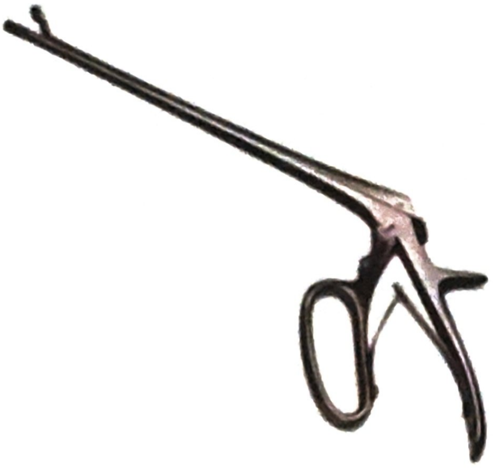
## PIPELLE ENDOMETRIAL SAMPLING DEVICE 00:31:08



- Used for Sampling of Endometrium

## TISCHLERS CERVICAL BIOPSY FORCEPS

00:32:37



- Has got teeth at the top
- Used for OPD procedures

## CARDIAC TOCOGRAPHY

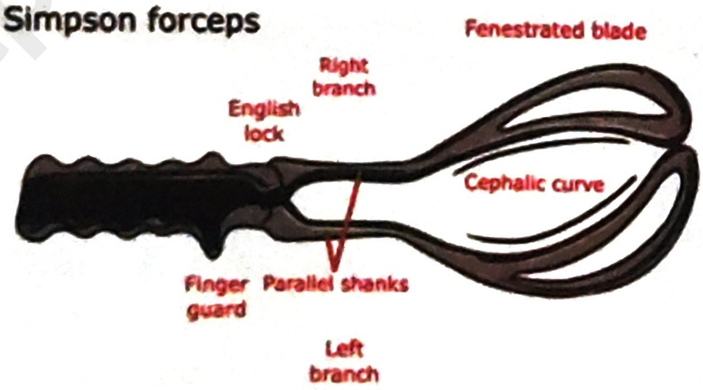
00:33:54

- It has 2 probes
- One for charting of FETAL HEART RATE
- Another for UTERINE CONTRACTIONS
- If only 1 probe is present → NON STRESS TEST

## FORCEPS

### SIMPSONS FORCEPS

00:35:54



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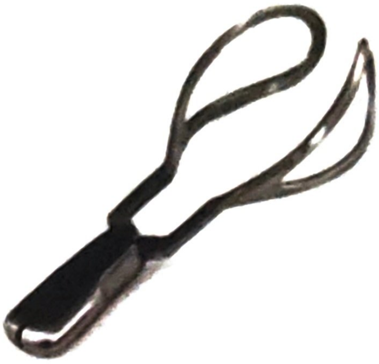
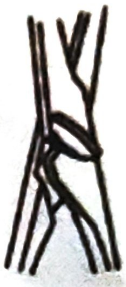
## WRIGLEYS FORCEPS 00:39:11

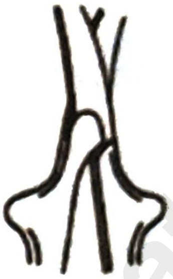


- Used for outlet procedures
- For stations > + 3

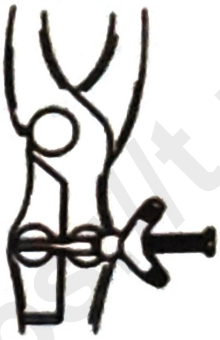
## FORCEPS LOCKS 00:39:49



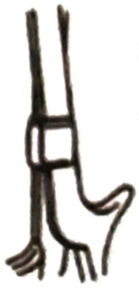
FRENCH LOCK



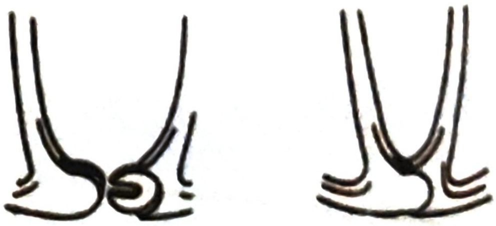
ENGLISH LOCK



GERMAN LOCK

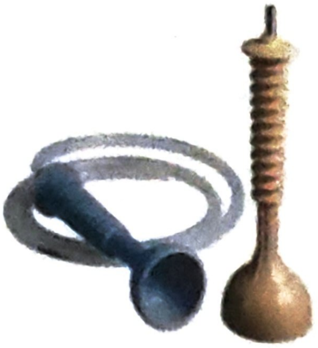


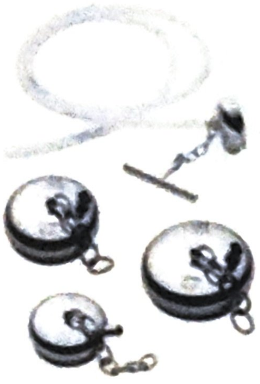
SLIDING LOCK



PIVOT LOCK

## VACCUM 00:40:46





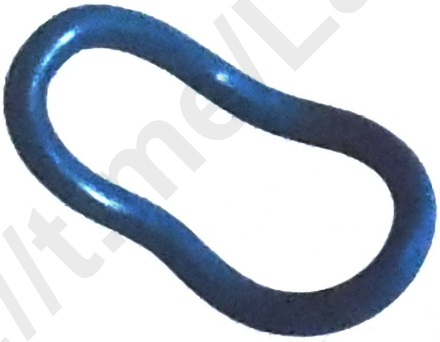
SILASTIC CUPS

METALLIC CUPS

- C/I in preterm delivery
- Suction pressure
  - Applied on head is 0.8kg/cm or 80 kpa
- It is a slow process
- Build vaccum for 2-8 minutes at least
- Swelling on head formed after vaccum k/a CHIGNON SWELLING

## PESSARY's 00:45:57

### HODGE PESSARY

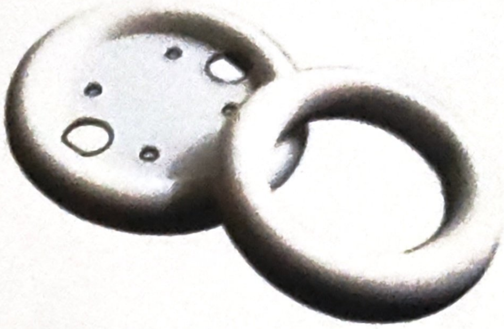


- Made of hard Rubber
- Pushed into vagina to correct retroversion
- For reducing the prolapse
- For correcting stress urinary incontinence

Q. How do you know the size of the pessary is adequate for relieving patient's complains?

A. The size of pessary which relieves the complains & does not give any added due discomfort.

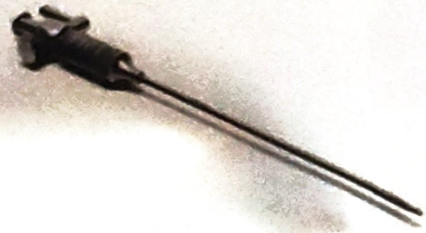
## RING PESSARY



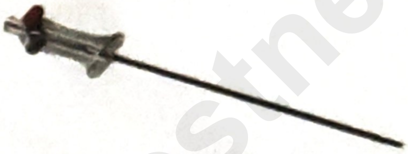
- Hollowed & fenestrated
- Used for reducing prolapse
- Can not correct retro version or stress urinary incontinence

## VEERES NEEDLE

00:47:45



METALLIC NEEDLE

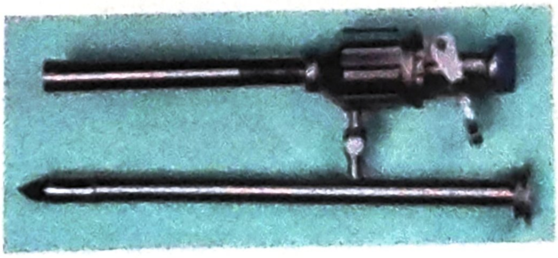


DISPOSABLE PLASTIC NEEDLE

- Can be reused after sterilizing
- Held in Pen Holding Fashion
- Used to get access into the abdomen
- Flow rate → 1- 2 l/min
  (To distend abdomen)
  Total → 2.5 – 3 liters of air
  Working pressure → 13-15 mmHg
  And never › 20 mmHg

## TROCAR & CANNULA

00:52:28



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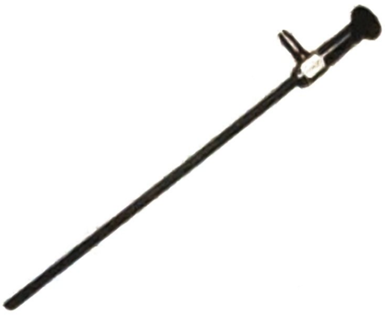
## LAPROSCOPE

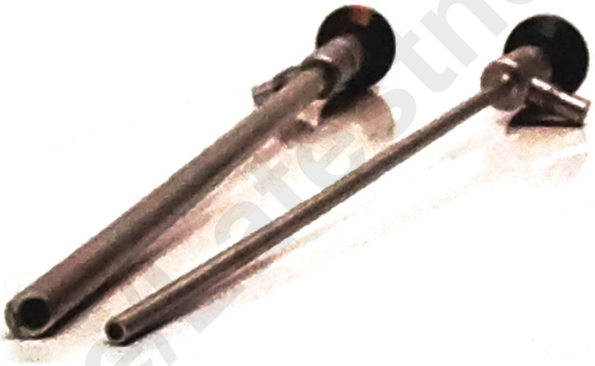
00:53:28



- Diameter = 10mm
- Small scopes = 5mm
- End of the scope can be:
  - 0°
  - Angulated (can see finer details)

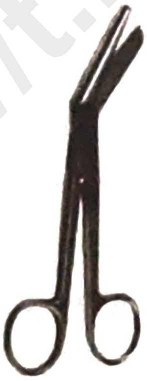
## TYPES OF LAPAROSCOPE

- 0°
- Angulated



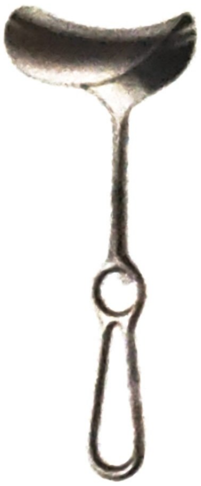
## EPISIOTOMY SCISSORS (BUSCH'S)

00:55:35

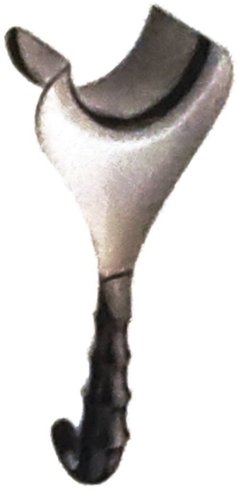


- Angulations takes the scissor away from the perineum & makes it easier to cut the vagina
- Always do episiotomy under L.A.

## DOYENS & DEE LEE's RETRACTOR 00:58:11



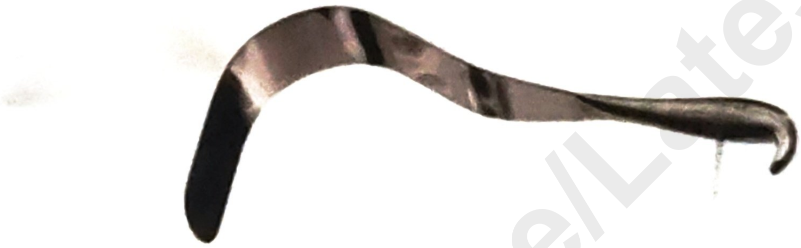
DOYEN's RETRACTOR



DEE LEE's RETRACTOR

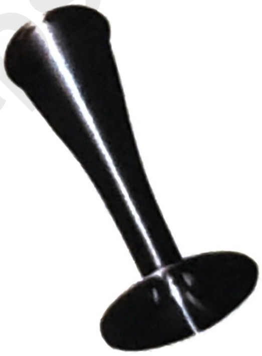
- Mostly used over the suprapubic area
- To retract the bladder
- Dee Lee's is lesser traumatic

## DEAVER's RETRACTOR 01:01:25



- Deeper retractor
- For deep abdominal Sx

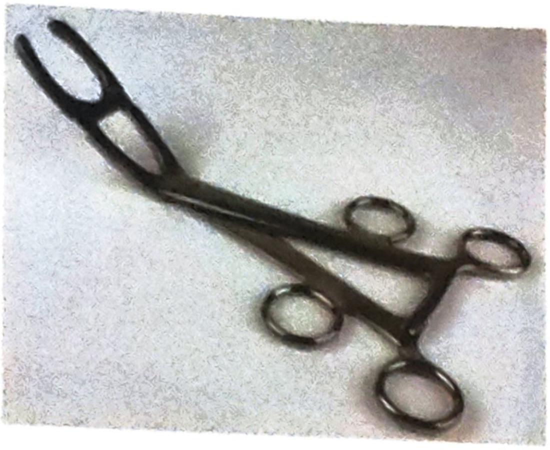
## PINARD's FETOSCOPE 01:02:09



- Much less used now-a-days

## BONNEY's MYOMECTOMY CLAMP

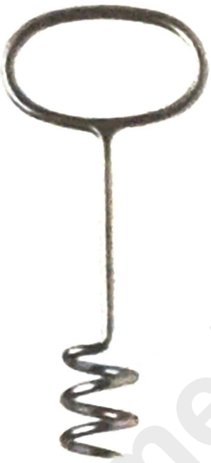
01:02:47



- Used to reduce blood loss during myomectomy
- Clamping the uterine arteries

## MYOMA SCREW

01:05:13



- Screwed into the fibroids & upward traction is applied

# OWN YOUR DREAM

My dad passed away when I was in the 12th grade, and as we managed to get a little over the shock, my mother was diagnosed with endometrial cancer. My grandmother was also not keeping well. At this time, when my presence at home was pivotal, the need to go out and fight for them struck the hardest.

Having stayed at home all my life, hostel life and experiences were all new to me. Interacting with my fellow hostellers was something I wouldn't have wanted to miss out on, but due to the circumstances at home, I needed to go home every alternate day. The experiences I've had, the lessons that I've learnt have instilled a level of maturity in me that I wouldn't have attained otherwise.

Before I entered the country's top tier medical college i.e. Madras Medical College, Chennai, I had the fortune to have had enrolled in a not so well-known peripheral government college at Thiruvarur.

I joined the college on 13th March 2017, as opposed to my batchmates who joined on 1st August 2016. My admission got delayed because I had a few legal battles to fight, 4 to be precise, against the government that led to my subsequent and successful attempt at securing my seat at MMC, Chennai.

I still remember my first day at college, going around the corridors in circles, asking for directions, trying to make up for the lost time, trying to make new friends, build a rapport with the faculty, struggling to maintain 75% attendance, and to prepare for the university exams. It was all very tiring. But I still managed to ace it, scoring 85% in Biochemistry in my 1st year of MBBS. Impressed with my performance, my Professor, Dr. Manju, sponsored my textbooks for the 2nd year. My faculty always had my back.

They constantly supported and encouraged me to do more and become better, especially Dr Shakila, M.D.(Physiology). Despite all the curveballs thrown my way, I managed to bounce back stronger. Today I am the National Joint Secretary, IMA-MSN and was even presented with the Chairman's Appreciation Award. I am making my mark in both academics and in the social sphere. I owe it all to my mother, Mrs. Shanthi, and my grandmother, Mrs. Jayalakshmi; their support keeps me motivated.

**Prashanth S**

Madras Medical College, Chennai

> Never give up on what you really want to do. A person with big dreams is more powerful than one with all the facts.
>
> **- Albert Einstein**

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